Set

Ρ

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

EARTHQUAKE RESISTANT NON ENGINEERED CONSTRUCTION

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM Max. Marks: 50

Instructions: 1) Figures to right indicate full marks.

2) Assume suitable data if necessary and mention it clearly.3) Solve any five questions.

Q.1	Explain the effects of an Earthquake.	10
Q.2	What are the causes of an Earthquake?	10
Q.3	Explain the different magnitude scales to measure an earthquake.	10
Q.4	What are causes of damages due to earthquake in the stone masonry construction?	10
Q.5	What is meant by Restoration of strength? What are techniques for restoration?	10
Q.6	Explain the soil liquefaction as an effect of earthquake.	10

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019

Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary and mention it clearly
- 3) Use of non-programmable calculator is allowed
- 4) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. The biodegradable organics deposited at the bed of stream undergoes 1) decomposition in self-purification of stream process. a) aerobic b) anaerobic photosynthesis c) inorganic d) 2) Biological treatment units are operated in growth phase of Microorganism. a) log b) lag d) c) declining all of above Incineration drastically reduces the _____ ____ of dried sludge. 3) a) Moisture b) Volume c) All of above Appearance d) wastes are highly corrosive for metals, concrete structures and also 4) harmful to aquatic life organic a) b) acidic C) alkaline d) oil and grease In a running pollutes stream if Deoxygenation is more than reareation then 5) in Do curve results. a) Sag b) Lag C) Hog d) None of these constant varies with temperature in case of effluent waste and river 6) water respectively. Deoxygenation a) b) Ultimate BOD Reoxygenation d) Both a and c C) The final end products of anaerobic digestion can be used for _____. 7) Electricity generation Cooking a) b) Composting and as a manure All of above C) d) is a process of aeration used for removal of gases from 8) wastewater. Thermal reduction Air stripping b) a) Adsorption d) Chemical oxidation C)

SLR-FM-100

Set

Max. Marks: 70

Seat No.

Marks: 14

					Set	
9)	a) c)	and industries are alway Dairy and textile Sugar and distillery	/s loc b) d)	ated in same premises. Paper pulp and fertilizer All of above		
10)	Beat indu a) c)	er and Jordan is one of the steps stry. Textile Pulp and paper	in ma b) d)	anufacturing process of Sugar Tannery		
11)	Dyei a) c)	ng is the one of manufacturing pr Textile Pulp and paper	ocess b) d)	s of industry. Sugar Tannery		
12)	Con a) c)	cept of CEPT is most suited for Large scale industries Power plants	b) d)	 Small scale industries None of these		
13)	a) c)	sludge is non-hazardous comp Sewage Both a and b	ared b) d)	to industrial sludge. Chemical industry None of these		
14)	Oil a a) c)	nd grease is commonly found in <u>.</u> Textile Pulp and paper	b) d)	_ effluent. Sugar Tannery		

SLR-FM-100

Ρ

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 and Q. No. 7 are compulsory.

- 2) Answer any two questions from each section.
- 2) Figures to the right indicate full marks.

Section - I

- Q.2 a) Explain in detail pollutant characteristics of industrial wastes compared to 05 sewage.
 - b) Explain the process of Ion-Exchange method for removal of dissolved 04 inorganic materials.
- **Q.3 a**) Explain any one method of waste strength reduction.
 - b) A waste stream saturated with DO has a flow of 1.4 m³/sec, BOD of 5 05 mg/Lit and rate constant of 0.3 /day. It receives an effluent discharge of 0.29 m³/sec having BOD 25 mg/lit and DO 6 mg/Lit and rate constant 0.12 /day. The average velocity of flow of the stream is 0.20 m/sec. Calculate DO deficit at point 20 km and 50 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20° C as 9.17 mg/Lit.
- Q.4 a) Explain how the volume of waste generated from industry can be reduced 05 by any two techniques.
 - b) Explain Streeter Phelps equation with meaning of each and every term in **04** it.

Q.5 Write short note on:

- a) Reverse Osmosis
- b) Electrodialysis
- c) Equalization tanks

Section - II

Q.6	 a) Mention pollution characteristics of industrial waste and suggest treatmethods for any two agro based industries. 	ient 05
	b) What are the sources of wastes in sugar industry? Discuss in detail.	04
Q.7	Give the characteristics of wastewater, draw the wastewater treatment flow diagram and explain in detail. a) Textile b) Tannery	05 05
Q.8	Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Paper and pulp b) Distillery	່ 05 04

Max. Marks: 56

SLR-FM-100

Set

Seat No.

09

SLR-FM-100 Set P 09

Q.9 Write short note on:

- a) Function of state pollution control board
- **b)** Massive lime treatment
- **c)** By Product recovery

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary and mention it clearly
- 3) Use of non-programmable calculator is allowed
- 4) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14 Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 _ is a process of aeration used for removal of gases from 1) wastewater. a) Thermal reduction b) Air stripping Adsorption Chemical oxidation C) d) 2) and _____ industries are always located in same premises. Dairy and textile Paper pulp and fertilizer a) b) Sugar and distillery c) d) All of above 3) Beater and Jordan is one of the steps in manufacturing process of _____ industry. a) Textile b) Sugar Tannery c) Pulp and paper d) Dyeing is the one of manufacturing process of industry. 4) Textile Sugar a) b) Tannery C) Pulp and paper d) Concept of CEPT is most suited for 5) Large scale industries b) Small scale industries a) c) Power plants d) None of these 6) sludge is non-hazardous compared to industrial sludge. Sewage Chemical industry a) b) Both a and b d) None of these c) Oil and grease is commonly found in effluent. 7) Textile b) Sugar a) Pulp and paper d) Tannery C) The biodegradable organics deposited at the bed of stream undergoes 8) decomposition in self-purification of stream process. a) aerobic anaerobic b) d) C) inorganic photosynthesis 9) Biological treatment units are operated in growth phase of Microorganism. log a) b) lag declining all of above c) d)

Set

Max. Marks: 70

SLR-FM-100

10) Incineration drastically reduces the _____ of dried sludge.

Moisture a)

b) Volume **SLR-FM-100**

Set Q

- All of above C) Appearance d)
- 11) _ wastes are highly corrosive for metals, concrete structures and also harmful to aquatic life
 - a) organic C) alkaline

- b) acidic d) oil and grease
- In a running pollutes stream if Deoxygenation is more than reareation then 12) in Do curve results.
 - Sag a)
 - b) Lag

b)

- None of these C) Hog d)
- ____ constant varies with temperature in case of effluent waste and river 13) water respectively.
 - Deoxygenation a)
- b) Ultimate BOD
- Reoxygenation Both a and c d) C)
- The final end products of anaerobic digestion can be used for _____. 14) Cooking
 - Electricity generation a)
 - Composting and as a manure d) All of above C)

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 and Q. No. 7 are compulsory.

- 2) Answer any two questions from each section.
- 2) Figures to the right indicate full marks.

Section - I

- **Q.2 a)** Explain in detail pollutant characteristics of industrial wastes compared to **05** sewage.
 - b) Explain the process of Ion-Exchange method for removal of dissolved
 04 inorganic materials.
- **Q.3 a**) Explain any one method of waste strength reduction.
 - b) A waste stream saturated with DO has a flow of 1.4 m³/sec, BOD of 5 05 mg/Lit and rate constant of 0.3 /day. It receives an effluent discharge of 0.29 m³/sec having BOD 25 mg/lit and DO 6 mg/Lit and rate constant 0.12 /day. The average velocity of flow of the stream is 0.20 m/sec. Calculate DO deficit at point 20 km and 50 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20° C as 9.17 mg/Lit.
- Q.4 a) Explain how the volume of waste generated from industry can be reduced 05 by any two techniques.
 - b) Explain Streeter Phelps equation with meaning of each and every term in **04** it.

Q.5 Write short note on:

- a) Reverse Osmosis
- b) Electrodialysis
- c) Equalization tanks

Section - II

Q.6	 a) Mention pollution characteristics of industrial waste and suggest treatm methods for any two agro based industries. 	ent 05
	b) What are the sources of wastes in sugar industry? Discuss in detail.	04
Q.7	 Give the characteristics of wastewater, draw the wastewater treatment flow diagram and explain in detail. a) Textile b) Tannery 	05 05
Q.8	 Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Paper and pulp b) Distillery 	 05 04

Max. Marks: 56

SLR-FM-100

Seat No.

Set Q

09

SLR-FM-100 Set Q 09

Q.9 Write short note on:

- a) Function of state pollution control board
- **b)** Massive lime treatment
- **c)** By Product recovery

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary and mention it clearly
- 3) Use of non-programmable calculator is allowed
- 4) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 1)
 - In a running pollutes stream if Deoxygenation is more than reareation then in Do curve results.

b)

Lag

a) Sag

a)

a)

- C) Hog d) None of these
- 2) constant varies with temperature in case of effluent waste and river water respectively.
 - Deoxygenation b) Ultimate BOD a)
 - C) Reoxygenation d) Both a and c
- 3) The final end products of anaerobic digestion can be used for _____.
 - Electricity generation Cooking b) a)
 - d) c) Composting and as a manure All of above
- is a process of aeration used for removal of gases from 4) wastewater.
 - Thermal reduction a) Adsorption c)
- b) Air stripping Chemical oxidation d)
- _ and _____ industries are always located in same premises. 5) Dairy and textile
 - Paper pulp and fertilizer b)
 - Sugar and distillery C)
 - d) All of above
- 6) Beater and Jordan is one of the steps in manufacturing process of _____ industry. a) Textile b) Sugar
 - Pulp and paper d) Tannery c)
- 7) Dyeing is the one of manufacturing process of _____ industry.
 - Textile a) Sugar b)
 - Pulp and paper C) d) Tannery
- Concept of CEPT is most suited for _ 8)
 - a) Large scale industries b) Small scale industries
 - Power plants d) None of these C)
- sludge is non-hazardous compared to industrial sludge. 9)
 - Chemical industry Sewade b)
 - Both a and b None of these C) d)

Seat No.



Max. Marks: 70

Marks: 14

10) Oil and grease is commonly found in _____ effluent.

a) Textile b) Sugar

c) Pulp and paper d) Tannery

- 11) The biodegradable organics deposited at the bed of stream undergoes ______ decomposition in self-purification of stream process.
 - a) aerobic b) anaerobic
 - c) inorganic d) photosynthesis
- 12) Biological treatment units are operated in _____ growth phase of Microorganism.
 - a) log b) lag
 - c) declining d) all of above
- 13) Incineration drastically reduces the _____ of dried sludge.
 - a) Moisture b) Volume
 - c) Appearance d) All of above
- 14) _____ wastes are highly corrosive for metals, concrete structures and also harmful to aquatic life
 - a) organic
 - c) alkaline

- b) acidic
- d) oil and grease

SLR-FM-100

Set R

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 and Q. No. 7 are compulsory.

- 2) Answer any two questions from each section.
- 2) Figures to the right indicate full marks.

Section - I

- Q.2 a) Explain in detail pollutant characteristics of industrial wastes compared to 05 sewage.
 - b) Explain the process of Ion-Exchange method for removal of dissolved
 04 inorganic materials.
- **Q.3 a**) Explain any one method of waste strength reduction.
 - b) A waste stream saturated with DO has a flow of 1.4 m³/sec, BOD of 5 05 mg/Lit and rate constant of 0.3 /day. It receives an effluent discharge of 0.29 m³/sec having BOD 25 mg/lit and DO 6 mg/Lit and rate constant 0.12 /day. The average velocity of flow of the stream is 0.20 m/sec. Calculate DO deficit at point 20 km and 50 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20° C as 9.17 mg/Lit.
- Q.4 a) Explain how the volume of waste generated from industry can be reduced 05 by any two techniques.
 - b) Explain Streeter Phelps equation with meaning of each and every term in **04** it.

Q.5 Write short note on:

- a) Reverse Osmosis
- b) Electrodialysis
- c) Equalization tanks

Section - II

Q.6	 a) Mention pollution characteristics of industrial waste and suggest treatment methods for any two agro based industries. 	ent 05
	b) What are the sources of wastes in sugar industry? Discuss in detail.	04
Q.7	Give the characteristics of wastewater, draw the wastewater treatment flow diagram and explain in detail. a) Textile b) Tannery	05 05
Q.8	 Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Paper and pulp b) Distillery 	05 04

Max. Marks: 56

SLR-FM-100

Seat No.

Set R

09

SLR-FM-100 Set R 09

Q.9 Write short note on:

- a) Function of state pollution control board
- **b)** Massive lime treatment
- **c)** By Product recovery

SLR-FM-100

Seat No.								Set	S
	1	В	.E. (Part	- II) (CGPA)	Exami	nati	ion Nov/Dec-2019		
					Engine	erin	g FATMENT		
Dav 8	Date	· Tue	INI sdav 26-1	JUSTRIAL V 1-2019	VASIE	IR	EATWIENT Max	Marks	· 70
Time:	02:30) PM	To 05:30 F	PM					
Instru	nstructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer								
		2)) Assume s	uitable data wh	nerever	nece	ssary and mention it clear	rly	
		3) 4)) Use of no) Figure to	n-programmab	le calcul te full m	lator arks	is allowed		
		т,	, i iguie to	MCQ/Object	ive Type	e Qu	estions		
Durat	ion: 3	0 Min	utes	- I				Marks	: 14
Q.1	Choo 1)	Beate	e correct a er and Jord	lan is one of th	om tne (e steps i	optic in ma	anufacturing process of	ence.	14
	,	indus	stry.		•	۲	Current -		
		a) c)	Pulp and p	baper		d)	Tannery		
	2)	Dyeir	ng is the or	ne of manufactu	uring pro	cess	s of industry.		
		a)	Textile Pulp and r	aner		d)	Sugar Tanperv		
	3)	Conc	ept of CFF	PT is most suite	ed for	u)	- annery		
	0)	a)	Large scal	e industries		b)	Small scale industries		
	1)	C)	Power pla	nts		d)	None of these		
	4)	 a)	_ sludge is Sewage	non-nazardou	s compa	area 1 b)	Chemical industry		
		c)	Both a and	db		d)	None of these		
	5)	Oil ai	nd grease i Textile	s commonly fo	und in _	h)	_effluent.		
		a) C)	Pulp and p	baper		d)	Tannery		
	6)	The b	biodegrada	ble organics de	eposited	at th	e bed of stream undergo	es	
			decomp aerobic	osition in self-	purificati	on oi b)	f stream process. anaerobic		
		c)	inorganic			d)	photosynthesis		
	7)	Biolo	gical treatr	nent units are o	operated	l in	growth phase	of	
		a)	log			b)	lag		
		c)	declining			d)	all of above		
	8)	Incin	eration dra	stically reduces	s the	C	of dried sludge.		
		c)	Appearance	ce		d)	All of above		
	9)	<u> </u>	_ wastes a	re highly corro	sive for ı	meta	ls, concrete structures an	d also	
		narm	tul to aqua	tic life		h)	acidic		

organic alkaline acidic oil and grease a) c) b) d)

Seat

In a running pollutes stream if Deoxygenation is more than reareation then 10) in Do curve results.

- a) Sag b) Lag C) Hog
 - None of these d)
- ____ constant varies with temperature in case of effluent waste and river 11) water respectively.
 - Deoxygenation b) a)
 - Ultimate BOD d) Both a and c

SLR-FM-100

Set S

- 12) The final end products of anaerobic digestion can be used for _____.
 - Electricity generation a)
- Cooking b)
- Composting and as a manure d) All of above
- 13) is a process of aeration used for removal of gases from wastewater.
 - Thermal reduction a)

Reoxygenation

C)

C)

c)

- b) Air stripping
- d) Chemical oxidation
- 14) and _____ industries are always located in same premises.
 - Dairy and textile a)

Adsorption

- b) Paper pulp and fertilizer
- Sugar and distillery C)
- d) All of above

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering INDUSTRIAL WASTE TREATMENT

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 and Q. No. 7 are compulsory.

- 2) Answer any two questions from each section.
- 2) Figures to the right indicate full marks.

Section - I

- Q.2 a) Explain in detail pollutant characteristics of industrial wastes compared to 05 sewage.
 - b) Explain the process of Ion-Exchange method for removal of dissolved
 04 inorganic materials.
- **Q.3 a**) Explain any one method of waste strength reduction.
 - b) A waste stream saturated with DO has a flow of 1.4 m³/sec, BOD of 5 05 mg/Lit and rate constant of 0.3 /day. It receives an effluent discharge of 0.29 m³/sec having BOD 25 mg/lit and DO 6 mg/Lit and rate constant 0.12 /day. The average velocity of flow of the stream is 0.20 m/sec. Calculate DO deficit at point 20 km and 50 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20° C as 9.17 mg/Lit.
- Q.4 a) Explain how the volume of waste generated from industry can be reduced 05 by any two techniques.
 - b) Explain Streeter Phelps equation with meaning of each and every term in **04** it.

Q.5 Write short note on:

- a) Reverse Osmosis
- b) Electrodialysis
- c) Equalization tanks

Section - II

Q.6	 a) Mention pollution characteristics of industrial waste and suggest treatment methods for any two agro based industries. 	nt 05
	b) What are the sources of wastes in sugar industry? Discuss in detail.	04
Q.7	Give the characteristics of wastewater, draw the wastewater treatment flow diagram and explain in detail. a) Textile b) Tannery	05 05
Q.8	 Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Paper and pulp b) Distillery 	05 04

Max. Marks: 56

SLR-FM-100

Seat No.

Set S

09

SLR-FM-100 Set S 09

Q.9 Write short note on:

- a) Function of state pollution control board
- **b)** Massive lime treatment
- **c)** By Product recovery

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

WATER POWER ENGINEERING

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Which of the following is not a requirement for site selection of 1) hydroelectric power plant?
 - a) Availability of water
- Large catchment area b)
- Rocky land d) Sedimentation c)
- 2) A hydrograph is a graph for the hydroelectric power plants, what information does this provide?
 - The discharge at any time during the period of consideration a)
 - b) Total volume of flow upto any time given by the area under the curve upto that time.

b)

- c) The mean run off during the period.
- d) All of these
- 3) The load factor for the peak day of the year determines the required _____.
 - a) Water storage b)
 - c) Generating capacity
- 4) Minimum pressure occurs in fall flowing power tunnel at the time _____.
 - a) load rejection load acceptance b)
 - c) head race Tail race d)
- 5) The pumped storage power plant in India Kadamparai (Tamilnadu)
 - Bhakra Nangal (Punjab) a)
 - Koyna (Maharashtra) d) Does not exist C)
- 6) Unit power in a turbine is _____.
 - a) pH^{1/2} b) P/H
 - P/H^{3/4} P/H^{3/2} c) d)
- The hydroelectric power plants are_ 7)
 - a) Operating cost is high and initial cost is high
 - b) Operating cost is low and initial cost is high
 - c) Operating cost is low and initial cost is low
 - d) Operating cost is high and initial cost is low

Max. Marks: 70

Marks: 14

SLR-FM-101



Set

- Pondage

- None d)

Page 2 of 16

- 8) Pelton turbines are mostly _____.
 - a) Horizontal b) Vertical
 - c) Inclined d) None of the above
- In francis turbine runner, the number of blades is generally of the order of _____.
 - a) 1-2
 - c) 6-8 d) 12-16
- 10) Which of following power plant has highest depreciation charges?
 - a) Nuclear plant b) Thermal plant
 - c) Diesel plant d) Hydroelectric plant
- 11) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called _____.
 - a) Penstock b) Spillways
 - c) Reservoir d) Fore bay
- 12) The draft tube is provided to _____.
 - a) reduce the effect of water hammer
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above
- 13) What is time period for one tide to occur in a day?
 - a) 6h, 12.5 min b) 6h, 40.5 min
 - c) 6h, 0 min d) 6h, 25.6 min
- 14) Difference between water height at high tide and water height at low tide is called_____
 - a) Tidal Variation b) Tidal Volume
 - c) Tidal Range d) Tidal Current

) Thermal plant) Hydroelectric p

4-6

b)

SLR-FM-101 Set P

SLR-FM-101

Seat	
No	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Tuesday,26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following questions.

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- **b)** What are the different salient factors to be considered in deciding the alignment of a tunnel in a hydroelectric project?
- c) What do you understand by mass curve of runoff? How can you determine the storage capacity of a reservoir with its help if a constant of a variable demand is known?
- d) Common load shared by two stations base load plant with 60 MW capacity and other being standby plant with 50 MW capacity. The yearly output for base load station is 220×10⁶ KWh, and for standby station is 24×10⁶ KWh. The peak load taken by standby station is 17 MW which works for 2300 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, pant use factor, and capacity factor for both the stations.
- e) The 95% dependable discharge of a river (discharge which would be approximately available 95% of the time) is 22m³/sec. If the utilized head is 22 m calculate
 - 1) The theoretical hp and kw
 - 2) Actual amount of power output
 - 3) Total yearly developable energy
 - 4) The actual capacity that may be installed to utilize all average flow and the corresponding energy

Q.3 Attempt any two of the following questions.

- a) A penstock pipe, 800 m long, takes off from a reservoir and feeds water to turbine, the level of which is 220 m below the reservoir water level. The first 300 m length of the penstock has a cross section area of 6 m² and the rest has an area of 4 m². The steady state discharge is $10m^3$ /sec. If the turbine gates are closed completely in 5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart= Z²=1.32)
- **b)** What do you understand by water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.
- c) What is a surge tank? What are its types? Explain any one with sketch. Also write what are the different loading conditions to determine the height of surge tank.

Max. Marks: 56

16



Section – II

Q.4 Attempt any four of the following questions.

- a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.
- **b)** What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?
- c) What are the advantages of reaction turbine over the pelton wheel in respect of efficiency, size cost and maintenance?
- d) Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 60000 kVA, 3 phase. 40 hertz generators. The generation are provided with 10 pairs of poles. The gross design head is 500 m and transmission efficiency of head race tunnel and penstocks together is to be 90 percent. The four units together will provide for a power of 340000 hp at a guaranteed efficiency of 90 percent. The nozzle efficiency is 0.98. Find -:
 - 1) the design discharge for the turbine,
 - 2) jet dia. and no. of jets,
 - 3) the nozzle tip diameter
 - 4) the pitch circle dia. of the wheel
 - 5) the specific speed and
 - 6) number of buckets on the wheel
- e) What are the types of intake structures? Explain any one with neat sketch.

Q.5 Attempt any two of the following questions.

- a) Describe how ocean tides one generated? With tidal cycle in view describe how hydropower can be generated? Also state the limitations of tidal power generation.
- **b)** At a hydroelectric power station Kaplan turbine is used which has following data,

Operating head = 22.5m output power at this head = 126 MW, discharge = $615 \text{ m}^3/\text{sec}$ speed = 68.2 rpm, Runner tiop tp tip diameter = 9.3 mHub diameter = 4.3mNumber of blades = 6, calculate the speed ratio, flow ratio, and the overall efficiency.

- c) Write short notes on
 - 1) Draft tube
 - 2) Anchor block

16

SLR-FM-101

Set

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

WATER POWER ENGINEERING

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Pelton turbines are mostly _____. 1)
 - a) Horizontal b)
 - c) Inclined d) None of the above
- 2) In francis turbine runner, the number of blades is generally of the order
 - of
 - 1-2 b) 4-6 a) c) 6-8 d) 12-16
- Which of following power plant has highest depreciation charges? 3)
 - a) Nuclear plant b) Thermal plant
 - c) Diesel plant d) Hydroelectric plant
- In hydro electric power station what is an enlarge body of water just 4) above the intake and used as a regulating reservoir called _____.
 - a) Penstock

c) Reservoir

- Spillways b) Fore bay
- d)
- 5) The draft tube is provided to _____.
 - a) reduce the effect of water hammer
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above
- 6) What is time period for one tide to occur in a day?
 - a) 6h, 12.5 min 6h, 40.5 min b)
 - c) 6h, 0 min d) 6h, 25.6 min
- Difference between water height at high tide and water height at low tide 7) is called
 - a) Tidal Variation b) **Tidal Volume**
 - **Tidal Range** d) **Tidal Current** C)

SLR-FM-101



Max. Marks: 70

Marks: 14

- - Vertical

				SLR-FM-101
				Set Q
8)	Wh hyd a) c)	ich of the following is not a requir lroelectric power plant? Availability of water Rocky land	emen b) d)	t for site selection of Large catchment area Sedimentation
9)	A h info a) b) c) d)	ydrograph is a graph for the hydro mation does this provide? The discharge at any time during Total volume of flow upto any tin upto that time. The mean run off during the peri All of these	oelec g the ne giv od.	tric power plants, what period of consideration ren by the area under the curve
10)	The a) c)	e load factor for the peak day of th Water storage Generating capacity	ne yea b) d)	ar determines the required Pondage None
11)	Min a) c)	imum pressure occurs in fall flow load rejection head race	ing po b) d)	ower tunnel at the time load acceptance Tail race
12)	The a) c)	e pumped storage power plant in Bhakra Nangal (Punjab) Koyna (Maharashtra)	India b) d)	Kadamparai (Tamilnadu) Does not exist
13)	Uni a) c)	t power in a turbine is pH ^{1/2} P/H ^{3/2}	b) d)	P/H P/H ^{3/4}

- 14)
- The hydroelectric power plants are_____ a) Operating cost is high and initial cost is high

 - b) Operating cost is low and initial cost is high
 c) Operating cost is low and initial cost is low
 d) Operating cost is high and initial cost is low

SLR-FM-101

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Tuesday,26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following questions.

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- **b)** What are the different salient factors to be considered in deciding the alignment of a tunnel in a hydroelectric project?
- c) What do you understand by mass curve of runoff? How can you determine the storage capacity of a reservoir with its help if a constant of a variable demand is known?
- d) Common load shared by two stations base load plant with 60 MW capacity and other being standby plant with 50 MW capacity. The yearly output for base load station is 220×10⁶ KWh, and for standby station is 24×10⁶ KWh. The peak load taken by standby station is 17 MW which works for 2300 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, pant use factor, and capacity factor for both the stations.
- e) The 95% dependable discharge of a river (discharge which would be approximately available 95% of the time) is 22m³/sec. If the utilized head is 22 m calculate
 - 1) The theoretical hp and kw
 - 2) Actual amount of power output
 - 3) Total yearly developable energy
 - 4) The actual capacity that may be installed to utilize all average flow and the corresponding energy

Q.3 Attempt any two of the following questions.

- a) A penstock pipe, 800 m long, takes off from a reservoir and feeds water to turbine, the level of which is 220 m below the reservoir water level. The first 300 m length of the penstock has a cross section area of 6 m² and the rest has an area of 4 m². The steady state discharge is $10m^3$ /sec. If the turbine gates are closed completely in 5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart= Z²=1.32)
- **b)** What do you understand by water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.
- c) What is a surge tank? What are its types? Explain any one with sketch. Also write what are the different loading conditions to determine the height of surge tank.

Max. Marks: 56

16



Section – II

Q.4 Attempt any four of the following questions.

- a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.
- **b)** What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?
- c) What are the advantages of reaction turbine over the pelton wheel in respect of efficiency, size cost and maintenance?
- d) Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 60000 kVA, 3 phase. 40 hertz generators. The generation are provided with 10 pairs of poles. The gross design head is 500 m and transmission efficiency of head race tunnel and penstocks together is to be 90 percent. The four units together will provide for a power of 340000 hp at a guaranteed efficiency of 90 percent. The nozzle efficiency is 0.98. Find -:
 - 1) the design discharge for the turbine,
 - 2) jet dia. and no. of jets,
 - 3) the nozzle tip diameter
 - 4) the pitch circle dia. of the wheel
 - 5) the specific speed and
 - 6) number of buckets on the wheel
- e) What are the types of intake structures? Explain any one with neat sketch.

Q.5 Attempt any two of the following questions.

- a) Describe how ocean tides one generated? With tidal cycle in view describe how hydropower can be generated? Also state the limitations of tidal power generation.
- **b)** At a hydroelectric power station Kaplan turbine is used which has following data,

Operating head = 22.5m output power at this head = 126 MW, discharge = $615 \text{ m}^3/\text{sec}$ speed = 68.2 rpm, Runner tiop tp tip diameter = 9.3 mHub diameter = 4.3mNumber of blades = 6, calculate the speed ratio, flow ratio, and the overall efficiency.

- c) Write short notes on
 - 1) Draft tube
 - 2) Anchor block

16

SLR-FM-101

Set

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

WATER POWER ENGINEERING

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Choose the correct alternatives from the options and rewrite the sentence. Q.1 14

b)

d)

- The pumped storage power plant in India 1)
 - a) Bhakra Nangal (Punjab)
 - c) Koyna (Maharashtra)
- 2) Unit power in a turbine is _____
 - a) pH^{1/2} b) P/H c) [.] P/H^{3/2} P/H^{3/4} d)
- 3) The hydroelectric power plants are_
 - a) Operating cost is high and initial cost is high
 - b) Operating cost is low and initial cost is high
 - Operating cost is low and initial cost is low c)
 - d) Operating cost is high and initial cost is low
- Pelton turbines are mostly _____. 4)
 - a) Horizontal b) Vertical
 - Inclined None of the above C) d)
- 5) In francis turbine runner, the number of blades is generally of the order of .
 - a) 1-2 4-6 b)
 - d) c) 6-8
- Which of following power plant has highest depreciation charges? 6)
 - Nuclear plant b) Thermal plant a) **Diesel plant** Hydroelectric plant c) d)
 - In hydro electric power station what is an enlarge body of water just
 - above the intake and used as a regulating reservoir called .
 - a) Penstock

7)

- Spillways b)
- c) Reservoir d) Fore bay

Kadamparai (Tamilnadu)

Does not exist

Marks: 14

R

Max. Marks: 70





Page 10 of 16

- 8) The draft tube is provided to .
 - a) reduce the effect of water hammer
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above
- 9) What is time period for one tide to occur in a day?
 - a) 6h, 12.5 min b) 6h, 40.5 min
 - c) 6h, 0 min 6h, 25.6 min d)
- 10) Difference between water height at high tide and water height at low tide is called
 - a) Tidal Variation Tidal Volume b)
 - c) Tidal Range d) Tidal Current
- 11) Which of the following is not a requirement for site selection of hydroelectric power plant?
 - a) Availability of water
- b) Large catchment area

SLR-FM-101

Set

- c) Rocky land d) Sedimentation
- 12) A hydrograph is a graph for the hydroelectric power plants, what information does this provide?
 - a) The discharge at any time during the period of consideration
 - b) Total volume of flow upto any time given by the area under the curve upto that time.
 - c) The mean run off during the period.
 - d) All of these

13) The load factor for the peak day of the year determines the required .

a) Water storage

- b) Pondage
- c) Generating capacity
- d) None
- 14) Minimum pressure occurs in fall flowing power tunnel at the time _____.
 - a) load rejection

b) load acceptance

c) head race

d) Tail race

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Tuesday,26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following questions.

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- **b)** What are the different salient factors to be considered in deciding the alignment of a tunnel in a hydroelectric project?
- c) What do you understand by mass curve of runoff? How can you determine the storage capacity of a reservoir with its help if a constant of a variable demand is known?
- d) Common load shared by two stations base load plant with 60 MW capacity and other being standby plant with 50 MW capacity. The yearly output for base load station is 220×10⁶ KWh, and for standby station is 24×10⁶ KWh. The peak load taken by standby station is 17 MW which works for 2300 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, pant use factor, and capacity factor for both the stations.
- e) The 95% dependable discharge of a river (discharge which would be approximately available 95% of the time) is 22m³/sec. If the utilized head is 22 m calculate
 - 1) The theoretical hp and kw
 - 2) Actual amount of power output
 - 3) Total yearly developable energy
 - 4) The actual capacity that may be installed to utilize all average flow and the corresponding energy

Q.3 Attempt any two of the following questions.

- a) A penstock pipe, 800 m long, takes off from a reservoir and feeds water to turbine, the level of which is 220 m below the reservoir water level. The first 300 m length of the penstock has a cross section area of 6 m² and the rest has an area of 4 m². The steady state discharge is $10m^3$ /sec. If the turbine gates are closed completely in 5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart= Z^2 =1.32)
- **b)** What do you understand by water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.
- c) What is a surge tank? What are its types? Explain any one with sketch. Also write what are the different loading conditions to determine the height of surge tank.

Max. Marks: 56

16

12



Seat No.

Section – II

Q.4 Attempt any four of the following questions.

- a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.
- **b)** What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?
- c) What are the advantages of reaction turbine over the pelton wheel in respect of efficiency, size cost and maintenance?
- d) Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 60000 kVA, 3 phase. 40 hertz generators. The generation are provided with 10 pairs of poles. The gross design head is 500 m and transmission efficiency of head race tunnel and penstocks together is to be 90 percent. The four units together will provide for a power of 340000 hp at a guaranteed efficiency of 90 percent. The nozzle efficiency is 0.98. Find -:
 - 1) the design discharge for the turbine,
 - 2) jet dia. and no. of jets,
 - 3) the nozzle tip diameter
 - 4) the pitch circle dia. of the wheel
 - 5) the specific speed and
 - 6) number of buckets on the wheel
- e) What are the types of intake structures? Explain any one with neat sketch.

Q.5 Attempt any two of the following questions.

- a) Describe how ocean tides one generated? With tidal cycle in view describe how hydropower can be generated? Also state the limitations of tidal power generation.
- **b)** At a hydroelectric power station Kaplan turbine is used which has following data,

Operating head = 22.5m output power at this head = 126 MW, discharge = 615 m^3 /sec speed = 68.2 rpm, Runner tiop tp tip diameter = 9.3 mHub diameter = 4.3mNumber of blades = 6, calculate the speed ratio, flow ratio, and the overall efficiency.

- c) Write short notes on
 - 1) Draft tube
 - 2) Anchor block

16

SLR-FM-101

Set

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

WATER POWER ENGINEERING

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data wherever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Which of following power plant has highest depreciation charges? 1)
 - a) Nuclear plant Thermal plant b)
 - c) Diesel plant Hydroelectric plant d)
- 2) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called _____.
 - a) Penstock Spillways b)
 - c) Reservoir d) Fore bay
- The draft tube is provided to _____ 3)
 - reduce the effect of water hammer a)
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above
- What is time period for one tide to occur in a day? 4)
 - a) 6h, 12.5 min b) 6h, 40.5 min
 - c) 6h, 0 min d) 6h. 25.6 min
- 5) Difference between water height at high tide and water height at low tide is called
 - a) Tidal Variation Tidal Volume b)
 - d) c) Tidal Range Tidal Current
- 6) Which of the following is not a requirement for site selection of hydroelectric power plant?
 - a) Availability of water
- Large catchment area b) d)

c) Rocky land

Sedimentation



Max. Marks: 70

Marks: 14

Set

SLR-FM-101

			SLR-FM-101
			Set S
7)	 A hydrograph is a graph for the hydrograph is a graph for the hydrograph is a graph for the hydrograph information does this provide? a) The discharge at any time during b) Total volume of flow upto any to upto that volume of flow upto any to upto that time. c) The mean run off during the period d) All of these 	froeled ng the ime gi eriod.	ctric power plants, what period of consideration ven by the area under the curve
8)	The load factor for the peak day of a) Water storage c) Generating capacity	the ye b) d)	ear determines the required Pondage None
9)	Minimum pressure occurs in fall flor a) load rejection c) head race	wing p b) d)	oower tunnel at the time load acceptance Tail race
10)	The pumped storage power plant ir a) Bhakra Nangal (Punjab) c) Koyna (Maharashtra)	n India b) d)	Kadamparai (Tamilnadu) Does not exist
11)	Unit power in a turbine is a) pH ^{1/2} c) P/H ^{3/2}	b) d)	P/H P/H ^{3/4}
12)	 The hydroelectric power plants are a) Operating cost is high and initia b) Operating cost is low and initia c) Operating cost is low and initia d) Operating cost is high and initia 	al cost l cost l cost al cost	_ is high is low is low
13)	Pelton turbines are mostly a) Horizontal c) Inclined	b) d)	Vertical None of the above
14)	In francis turbine runner, the number	lades is generally of the order	
	a) 1-2 c) 6-8	b) d)	4-6 12-16

SLR-FM-101

Seat	
No	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Tuesday,26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Draw neat labeled diagrams whenever necessary.
- 5) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following questions.

- a) What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?
- **b)** What are the different salient factors to be considered in deciding the alignment of a tunnel in a hydroelectric project?
- c) What do you understand by mass curve of runoff? How can you determine the storage capacity of a reservoir with its help if a constant of a variable demand is known?
- d) Common load shared by two stations base load plant with 60 MW capacity and other being standby plant with 50 MW capacity. The yearly output for base load station is 220×10⁶ KWh, and for standby station is 24×10⁶ KWh. The peak load taken by standby station is 17 MW which works for 2300 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, pant use factor, and capacity factor for both the stations.
- e) The 95% dependable discharge of a river (discharge which would be approximately available 95% of the time) is 22m³/sec. If the utilized head is 22 m calculate
 - 1) The theoretical hp and kw
 - 2) Actual amount of power output
 - 3) Total yearly developable energy
 - 4) The actual capacity that may be installed to utilize all average flow and the corresponding energy

Q.3 Attempt any two of the following questions.

- a) A penstock pipe, 800 m long, takes off from a reservoir and feeds water to turbine, the level of which is 220 m below the reservoir water level. The first 300 m length of the penstock has a cross section area of 6 m² and the rest has an area of 4 m². The steady state discharge is $10m^3$ /sec. If the turbine gates are closed completely in 5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart= Z^2 =1.32)
- **b)** What do you understand by water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.
- c) What is a surge tank? What are its types? Explain any one with sketch. Also write what are the different loading conditions to determine the height of surge tank.

Max. Marks: 56

16

Section – II

Q.4 Attempt any four of the following questions.

- a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.
- **b)** What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?
- c) What are the advantages of reaction turbine over the pelton wheel in respect of efficiency, size cost and maintenance?
- d) Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 60000 kVA, 3 phase. 40 hertz generators. The generation are provided with 10 pairs of poles. The gross design head is 500 m and transmission efficiency of head race tunnel and penstocks together is to be 90 percent. The four units together will provide for a power of 340000 hp at a guaranteed efficiency of 90 percent. The nozzle efficiency is 0.98. Find -:
 - 1) the design discharge for the turbine,
 - 2) jet dia. and no. of jets,
 - 3) the nozzle tip diameter
 - 4) the pitch circle dia. of the wheel
 - 5) the specific speed and
 - 6) number of buckets on the wheel
- e) What are the types of intake structures? Explain any one with neat sketch.

Q.5 Attempt any two of the following questions.

- a) Describe how ocean tides one generated? With tidal cycle in view describe how hydropower can be generated? Also state the limitations of tidal power generation.
- **b)** At a hydroelectric power station Kaplan turbine is used which has following data,

Operating head = 22.5m output power at this head = 126 MW, discharge = 615 m^3 /sec speed = 68.2 rpm, Runner tiop tp tip diameter = 9.3 mHub diameter = 4.3mNumber of blades = 6, calculate the speed ratio, flow ratio, and the overall efficiency.

- c) Write short notes on
 - 1) Draft tube
 - 2) Anchor block

16

SLR-FM-101

Set

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. (Each MCQ carries two marks)
 - For RCC slab the slump of the concrete should be _____. 1)
 - a) 0-25 mm 25-50 mm b)
 - c) 25-100 mm d) 50-100 mm
 - 2) The workability of the concrete by slump test is expressed as _____.
 - a) Mm³/h Mm²/h b)
 - c) Mm/h Mm d)

Grading of aggregate 3)

- a) Affects the workability
- b) Affects the strength of concrete
- c) Is depends on the shape & texture of the particles of the aggregates
- d) All the above is true
- 4) In case the concrete is to be transported by pumping, the slump should be
 - a) More than 100mm c) Between 25mm to 50mm
 - b) Between 50mm to 70mm d) More than 25mm

6

9

- Initial setting time is maximum for _ 5)
 - a) Protland-pozzolona cement b) Protland-slag cement High strength Portland Cement
 - c) Low-heat portland cement d)
- For concrete mix pH value of water shall not be less than _____. 6)
 - a) 7 b) d)
 - c) 8

Max. Marks: 70

Marks: 14

14





Set

Seat No.

7) The standard consistency of a cement paste is define as _

- i) Consistency which will permit vicat plunger to penetrate to a depth of 33 to 35 mm from the top of the mould.
- ii) Consistency which will permit vicat plunger to penetrate to a depth of 05 to 07 mm from the top of the mould.
- iii) Consistency which will permit vicat plunger to penetrate to a depth of 33 to 35 mm from the bottom of the mould.
- iv) Consistency which will permit vicat plunger to penetrate to a depth of 05 to 07 mm from the bottom of the mould.
- a) Only i)

Only iv)

c)

b) Only ii) d) i) & iv) both **SLR-FM-102**

Set P

SLR-FM-102

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 & Q. No. 6 is compulsory. Solve any two questions from each section.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	Write in detail how the mineral admixtures are classified.	10
Q.3	Write in brief about relationship between strength and density of concrete.	09
Q.4	Explain specific differentiation between High performance concrete and High strength concrete.	09
0.5	What is self compacting concrete? Explain why vibrator is not needed for self	٥Q

Q.5 What is self compacting concrete? Explain why vibrator is not needed for selfO9 compacting concrete.

Section – II

Q.6	Explain the design considerations of roller-compacted concrete.	10
Q.7	How is the ready mixed concrete specified to satisfy the requirement in the fresh & hardened state?	09

- **Q.8** In mix proportioning, why is it desirable to use the minimum quantity of water. **09**
- Q.9 What are the advantages and disadvantages of revibration of concrete? 09



Max. Marks: 56
Set

Max. Marks: 70

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Marks: 14

14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. (Each MCQ carries two marks)
 - Initial setting time is maximum for 1)

a)	Protland-pozzolona cement	b)	Protland-slag cement
C)	Low-heat portland cement	d)	High strength Portland Cement

c) Low-heat portland cement d)

2) For concrete mix pH value of water shall not be less than _____.

- a) 7 b) 6
- c) 8 d) 9

3) The standard consistency of a cement paste is define as i)

- Consistency which will permit vicat plunger to penetrate to a depth of 33 to 35 mm from the top of the mould.
- Consistency which will permit vicat plunger to penetrate to a depth ii) of 05 to 07 mm from the top of the mould.
- iii) Consistency which will permit vicat plunger to penetrate to a depth of 33 to 35 mm from the bottom of the mould.
- Consistency which will permit vicat plunger to penetrate to a depth iv) of 05 to 07 mm from the bottom of the mould.
- Only i) a) b) Only ii)
- Only iv) d) i) & iv) both C)

4) For RCC slab the slump of the concrete should be _

- a) 0-25 mm b) 25-50 mm
- c) 25-100 mm d) 50-100 mm
- 5) The workability of the concrete by slump test is expressed as _____.
 - a) Mm³/h b)
 - c) Mm/h d) Mm
- Grading of aggregate _ 6)
 - a) Affects the workability
 - b) Affects the strength of concrete
 - c) Is depends on the shape & texture of the particles of the aggregates
 - d) All the above is true

- Mm²/h

Set Q

- In case the concrete is to be transported by pumping, the slump should 7) be _____. a) More than 100mm

 - c) Between 25mm to 50mm
- b) Between 50mm to 70mm
- d) More than 25mm

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 & Q. No. 6 is compulsory. Solve any two questions from each section.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	Write in detail how the mineral admixtures are classified.	10
Q.3	Write in brief about relationship between strength and density of concrete.	09
Q.4	Explain specific differentiation between High performance concrete and High strength concrete.	09
Q.5	What is self compacting concrete? Explain why vibrator is not needed for self	09

Q.5 What is self compacting concrete? Explain why vibrator is not needed for self 09 compacting concrete.

Section – II

Q.6	Explain the design considerations of roller-compacted concrete.	10
Q.7	How is the ready mixed concrete specified to satisfy the requirement in the fresh & hardened state?	09
~ ~	The set of	~~

- **Q.8** In mix proportioning, why is it desirable to use the minimum quantity of water. **09**
- Q.9 What are the advantages and disadvantages of revibration of concrete? 09



Set

Max. Marks: 70

R

Seat No.

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. (Each MCQ carries two marks)
 - Grading of aggregate 1)
 - a) Affects the workability
 - b) Affects the strength of concrete
 - c) Is depends on the shape & texture of the particles of the aggregates
 - d) All the above is true
 - 2) In case the concrete is to be transported by pumping, the slump should be
 - a) More than 100mm
- b) Between 50mm to 70mm
- c) Between 25mm to 50mm d)
 - More than 25mm
- 3) Initial setting time is maximum for Protland-pozzolona cement
 - b) Protland-slag cement
 - c) Low-heat portland cement d) High strength Portland Cement
- For concrete mix pH value of water shall not be less than . 4)
 - a) 7 b) 6
 - 9 c) 8 d)
- The standard consistency of a cement paste is define as _ 5)
 - Consistency which will permit vicat plunger to penetrate to a depth i) of 33 to 35 mm from the top of the mould.
 - Consistency which will permit vicat plunger to penetrate to a depth ii) of 05 to 07 mm from the top of the mould.
 - Consistency which will permit vicat plunger to penetrate to a depth iii) of 33 to 35 mm from the bottom of the mould.
 - Consistency which will permit vicat plunger to penetrate to a depth iv) of 05 to 07 mm from the bottom of the mould.
 - Only i) a) b) Only ii)
 - Only iv) i) & iv) both d) c)
- For RCC slab the slump of the concrete should be 6)
 - a) 0-25 mm 25-50 mm b)
 - c) 25-100 mm 50-100 mm d)



- The workability of the concrete by slump test is expressed as _____.a) Mm³/hb) Mm²/hc) Mm/hd) Mm 7)

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 & Q. No. 6 is compulsory. Solve any two questions from each section.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	Write in detail how the mineral admixtures are classified.	10
Q.3	Write in brief about relationship between strength and density of concrete.	09
Q.4	Explain specific differentiation between High performance concrete and High strength concrete.	09
Q.5	What is self compacting concrete? Explain why vibrator is not needed for self	09

Q.5 What is self compacting concrete? Explain why vibrator is not needed for self compacting concrete.

Section – II

Q.6	Explain the design considerations of roller-compacted concrete.	10
Q.7	How is the ready mixed concrete specified to satisfy the requirement in the fresh & hardened state?	09
\sim	la priver a presidenti a su device it de sinche de super the president presentite of super-	~~

- **Q.8** In mix proportioning, why is it desirable to use the minimum quantity of water. **09**
- Q.9 What are the advantages and disadvantages of revibration of concrete? 09



Seat No.

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. (Each MCQ carries two marks)
 - For concrete mix pH value of water shall not be less than . 1)
 - a) 7 b) 6 c) 8 d)
 - 2) The standard consistency of a cement paste is define as
 - Consistency which will permit vicat plunger to penetrate to a depth i) of 33 to 35 mm from the top of the mould.
 - Consistency which will permit vicat plunger to penetrate to a depth ii) of 05 to 07 mm from the top of the mould.
 - Consistency which will permit vicat plunger to penetrate to a depth iii) of 33 to 35 mm from the bottom of the mould.
 - Consistency which will permit vicat plunger to penetrate to a depth iv) of 05 to 07 mm from the bottom of the mould.
 - Only i) Only ii) a) b)
 - Only iv) C) d) i) & iv) both

3) For RCC slab the slump of the concrete should be

- a) 0-25 mm 25-50 mm b)
- 25-100 mm d) 50-100 mm C)

The workability of the concrete by slump test is expressed as _____. 4)

- a) Mm³/h b)
- c) Mm/h d)
- 5) Grading of aggregate _
 - a) Affects the workability
 - b) Affects the strength of concrete
 - c) Is depends on the shape & texture of the particles of the aggregates
 - d) All the above is true
- In case the concrete is to be transported by pumping, the slump should 6) be
 - a) More than 100mm Between 25mm to 50mm c)
- Between 50mm to 70mm b)
- d) More than 25mm

Mm²/h Mm

Set

- 9



- Initial setting time is maximum for _a) Protland-pozzolona cementc) Low-heat portland cement 7)
- b)
- Protland-slag cement High strength Portland Cement d)

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Civil Engineering ADVANCED CONCRETE TECHNOLOGY

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 & Q. No. 6 is compulsory. Solve any two questions from each section.

- 2) Figures to right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	Write in detail how the mineral admixtures are classified.	10
Q.3	Write in brief about relationship between strength and density of concrete.	09
Q.4	Explain specific differentiation between High performance concrete and High strength concrete.	09
Q.5	What is self compacting concrete? Explain why vibrator is not needed for self	09

Q.5 What is self compacting concrete? Explain why vibrator is not needed for self 09 compacting concrete.

Section – II

Q.6	Explain the design considerations of roller-compacted concrete.	10
Q.7	How is the ready mixed concrete specified to satisfy the requirement in the fresh & hardened state?	09
~ ~		

- **Q.8** In mix proportioning, why is it desirable to use the minimum quantity of water. **09**
- Q.9 What are the advantages and disadvantages of revibration of concrete? 09



		OPTIMIZATION TI	ECH	NIQUES
Day Time	& Date : 02:3	e: Tuesday, 26-11-2019 0 PM To 05:30 PM		Max. Marks: 70
Instr	uctior	 1) Question no. 1 is compulsory. It in Answer Book Page No. 3. Ea 2) Answer MCQ/Objective type que To mention, Q.P. Set (P/Q/R/S) 	t shou ich qu iestio on T	uld be solved in first 30 minutes uestion carries one marks. ns on Page No. 3 only. Don't forget op of Page.
Dura	tion [.] 3	0 Minutes		Marks [,] 14
Q.1	Choc	ese the correct alternatives from the	opti	ons and rewrite the sentence. 14
	1)	 Constraints in an LP model represent a) Limitations b) Requirements c) Balancing limitations and requirer d) All of these 	s	
	2)	Simple linear programming problem w	vith _	variables can be easily
		a) One Decisionc) Three Decision	b) d)	Four Decision Two Decision
	3)	For a maximization problem the object artificial variable a) + M c) Zero	tive f b) d)	unction coefficient for an - M None of the options
	4)	What is also defined as the non-negaLHS of the constraint to convert the ina) Slack Variablec) Key Element	tive v nequa b) d)	ariables which are added in the lity '≤' into an equation? Simplex Algorithm None of the above
	5)	Which variables are fictitious and cana) Optimal Variablec) Artificial Variable	not ha b) d)	ave any physical meaning? Decision Variable None of the above
	6)	A basic solution which also satisfies the variables are non-negative is calleda) Basic feasible solution c) Optimal solution	he co b) d)	ndition in which all basic Feasible solution None of the above
	7)	To find the optimal solution, we apply a) LPP c) MODI method	b) d)	 VAM Rim
	8)	 VAM stands for a) Vogeal's Approximation method b) Vegeal's Approximate method c) Vangel's Approximation method d) Vodel's Approximation method 		

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil** Engineering

SLR-FM-105

Set P

- Games with saddle point are _____ in the nature. 9)
 - a) Deterministic b) Probabilistic
 - c) Stochastic d) Normative
- In Vogel's Approximation Method, the opportunity cost associated with a 10) row is determined by .
 - a) The difference between the smallest cost and next smallest cost in the row.

Set P

- b) The difference between the smallest unused cost and the next smallest unused cost the row.
- c) The difference between the smallest cost and the next smallest unused cost in the row.
- d) None of these
- 11) Which of the following criteria for decision making uses pessimistic decisions?
 - a) Minimax b) Maximin
 - c) Laplace Hurwicz d)
- Neural Networks are complex _____ with many parameters. 12)
 - a) Linear functions Non-linear functions b)
 - c) Discrete Functions d) **Exponential Functions**
- EOQ is a (an) _____ inventory system. 13)
 - a) Periodic b) Continuous c) Optimal Economic d)
- 14) The inventory carrying costs are also called as _____.
 - a) Procurement costs
 - Set-up costs b) c) Storage costs d) None of above

08

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and Question No. 6 are compulsory.

2) Attempt any two questions out of Q. 3, 4, 5.

- 3) Attempt any two questions out of Q. 7, 8, 9.
- 4) Assume suitable data whenever required.
- 5) Use of non-programmable calculator is allowed.

Section I

- **Q.2 a)** What is linear programming model? Write General form of linear programming model.
 - b) A company manufactures two types of chairs types A and types B. Both types of chairs pass through three processes. Shaping, setting and finishing. The standard manhours for each process per unit and available manhours for each department are given in the table below.

	Departments				
Chairs	Shaping	Setting Finishing			
	Processing time per unit (
A	6	2	3.6		
В	4	4	4		
Available Manhours	3600	2000	3600		

The availability of wood is sufficient to produce 500 nos. of chairs of types A and 400 nos. of chairs of type B. Each chair of type A gives a profit of Rs. 25/- While each chair of type B gives a profit of Rs. 20/-.

Formulate the L.P. Model and find graphically the quantity of each type of chairs to be produced to maximize the profit

Q.3 Find the shortest distance between node (1) & node (7)



Max. Marks: 56

04

SLR-FM-105

Set

Set Ρ

Q.4 Solve the following transportation model using least cost method & whether 08 further optimization using "MODI" is possible? If further optimizations possible then optimize it further.

Supply	Dist	ributio	Supply		
Points	D_1	D ₂	D ₃	D ₄	Capacity
O ₁	1	2	1	4	30
O ₂	3	3	2	1	50
O ₃	4	2	5	9	20
Requirement	20	40	30	10	

Q.5 Analyse the function $f(x) = x^2 + 5x + 6$ and classify the stationary point as 08 maxima / minina /point of inflection.

Section – II

- Q.6 What is decision tree? How it is to be used in decision making process. 04 a) 80
 - b) Solve the game graphically.

- Q.7 A particular item has a demand 15000 units per year. The cost of one **08** procurements is Rs. 200 and holding cost per unit is Rs.4 per year. The replacement is instantaneous and no shortages are allowed. Determine.
 - The economic lot size. 1)
 - 2) The number of orders per year.
 - 3) The time between two orders.
 - 4) The total cost per year of the cost of one unit is Rs. 2.
- What is integer programming? What are its types? Q.8 a) 03
 - Write general form of integer programming model. b)
- Q.9 Using artificial neural network technique find out output for following network 80 using binary (0,1) and bipolar (-1,1) activation function.



B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Tuesday, 26-11-2019

Seat

No.

Time: 02:30 PM To 05:30 PM

- **Instructions:** 1) Question no. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one marks.
 - 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget To mention, Q.P. Set (P/Q/R/S) on Top of Page.

MCQ/Objective Type Questions

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

1) VAM stands for _

Duration: 30 Minutes

- a) Vogeal's Approximation method
- b) Vegeal's Approximate method
- c) Vangel's Approximation method
- d) Vodel's Approximation method
- 2) Games with saddle point are _____ in the nature.
 - a) Deterministic b) Probabilistic
 - c) Stochastic d) Normative
- In Vogel's Approximation Method, the opportunity cost associated with a row is determined by _____.
 - a) The difference between the smallest cost and next smallest cost in the row.
 - b) The difference between the smallest unused cost and the next smallest unused cost the row.
 - c) The difference between the smallest cost and the next smallest unused cost in the row.
 - d) None of these
- 4) Which of the following criteria for decision making uses pessimistic decisions?
 - a) Minimax b) Maximin
 - c) Laplace d) Hurwicz
- 5) Neural Networks are complex _____ with many parameters.
 - a) Linear functions b) Non-linear functions
 - c) Discrete Functions d) Exponential Functions
- 6) EOQ is a (an) _____ inventory system.
 - a) Periodic b) Continuous
 - c) Optimal d) Economic
- 7) The inventory carrying costs are also called as _____
 - a) Procurement costs
 - c) Storage costs d) None of above

Set-up costs

b)

SLR-FM-105

Set Q

Set | Q 8) Constraints in an LP model represents . a) Limitations b) Requirements c) Balancing limitations and requirement d) All of these 9) Simple linear programming problem with _____ variables can be easily solved by the graphical method. a) One Decision b) Four Decision c) Three Decision d) Two Decision For a maximization problem the objective function coefficient for an 10) artificial variable _____. a) + M b) - M c) Zero d) None of the options What is also defined as the non-negative variables which are added in the 11) LHS of the constraint to convert the inequality ' \leq ' into an equation? a) Slack Variable Simplex Algorithm b) c) Key Element d) None of the above Which variables are fictitious and cannot have any physical meaning? 12) a) Optimal Variable **Decision Variable** b) c) Artificial Variable None of the above d) A basic solution which also satisfies the condition in which all basic 13) variables are non-negative is called _ a) Basic feasible solution b) Feasible solution c) Optimal solution d) None of the above To find the optimal solution, we apply 14) a) LPP b) VAM

c) MODI method d) Rim

SLR-FM-105

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Г

Instructions: 1) Question No. 2 and Question No. 6 are compulsory.

-

2) Attempt any two questions out of Q. 3, 4, 5.

- 3) Attempt any two questions out of Q. 7, 8, 9.
- 4) Assume suitable data whenever required.
- 5) Use of non-programmable calculator is allowed.

Section I

- **Q.2 a)** What is linear programming model? Write General form of linear programming model.
 - b) A company manufactures two types of chairs types A and types B. Both types of chairs pass through three processes. Shaping, setting and finishing. The standard manhours for each process per unit and available manhours for each department are given in the table below.

	Departments						
Chairs	Shaping	Setting	Finishing				
	Processi	ing time pe	r unit (hrs)				
А	6	2	3.6				
В	4	4	4				
Available Manhours	3600	2000	3600				

-

The availability of wood is sufficient to produce 500 nos. of chairs of types A and 400 nos. of chairs of type B. Each chair of type A gives a profit of Rs. 25/- While each chair of type B gives a profit of Rs. 20/-.

Formulate the L.P. Model and find graphically the quantity of each type of chairs to be produced to maximize the profit

Q.3 Find the shortest distance between node (1) & node (7)



Max. Marks: 56

SLR-FM-105



08

Set Q

Q.4 Solve the following transportation model using least cost method & whether 08 further optimization using "MODI" is possible? If further optimizations possible then optimize it further.

Supply	Dist	ributio	Supply		
Points	D ₁	D ₂	D ₃	D_4	Capacity
O ₁	1	2	1	4	30
O ₂	3	3	2	1	50
O ₃	4	2	5	9	20
Requirement	20	40	30	10	

Q.5 Analyse the function $f(x) = x^2 + 5x + 6$ and classify the stationary point as 08 maxima / minina /point of inflection.

Section – II

- Q.6 What is decision tree? How it is to be used in decision making process. 04 a) 80
 - b) Solve the game graphically.

- Q.7 A particular item has a demand 15000 units per year. The cost of one 80 procurements is Rs. 200 and holding cost per unit is Rs.4 per year. The replacement is instantaneous and no shortages are allowed. Determine.
 - The economic lot size. 1)
 - 2) The number of orders per year.
 - 3) The time between two orders.
 - 4) The total cost per year of the cost of one unit is Rs. 2.
- What is integer programming? What are its types? Q.8 a) 03
 - Write general form of integer programming model. b)
- Q.9 Using artificial neural network technique find out output for following network 80 using binary (0,1) and bipolar (-1,1) activation function.



	·		B.E. (Part - II) (CGPA) Exam Civil Engine	inati erin	on Nov/Dec-2019 a)
			OPTIMIZATION TE	CHN	9 NIQUES	
iy a ne	& Date : 02:30	e: Tu D PN	ıesday, 26-11-2019 ∕I To 05:30 PM			Max. Marks: 70
str	uctior	IS:	 Question no. 1 is compulsory. It in Answer Book Page No. 3. Eac Answer MCQ/Objective type que To mention, Q.P. Set (P/Q/R/S) 	shou ch qu estion on To	ld be solved in first 3 estion carries one ma is on Page No. 3 only op of Page.	0 minutes arks. y. Don't forget
			MCQ/Objective Typ	e Qu	estions	
ra	tion: 3	0 Mi	inutes			Marks: 14
1	Choc 1)	wh Wh a) c)	the correct alternatives from the ich variables are fictitious and canr Optimal Variable Artificial Variable	optio not ha b) d)	ons and rewrite the s ive any physical mea Decision Variable None of the above	sentence. 14 ning?
	2)	A b vari a) c)	asic solution which also satisfies th ables are non-negative is called Basic feasible solution Optimal solution	e cor b) d)	ndition in which all ba Feasible solution None of the above	sic
	3)	To a) c)	find the optimal solution, we apply LPP MODI method	b) d)	 VAM Rim	
	4)	VAI a) b) c) d)	M stands for Vogeal's Approximation method Vegeal's Approximate method Vangel's Approximation method Vodel's Approximation method			
	5)	Gai a) c)	mes with saddle point are in Deterministic Stochastic	the n b) d)	ature. Probabilistic Normative	
	6)	In ∖ row a) b)	/ogel's Approximation Method, the r is determined by The difference between the smalle row. The difference between the smalle	oppo est co est un	rtunity cost associate st and next smallest used cost and the ne	ed with a cost in the ext
		c) d)	The difference between the smalle unused cost in the row. None of these	est co	st and the next smal	lest
	7)	Wh dec	ich of the following criteria for decis	sion n	naking uses pessimis	stic

Da

Tin

Seat

No.

Ins

Du

Q.

- - a) Minimax Maximin b)
 - c) Laplace Hurwicz d)

SLR-FM-105

Set R

			SLR-FM-105
			Set R
8)	Neural Networks are complex a) Linear functions c) Discrete Functions	with r b) d)	many parameters. Non-linear functions Exponential Functions
9)	EOQ is a (an) inventory system a) Periodic c) Optimal	m. b) d)	Continuous Economic
10)	The inventory carrying costs are also a) Procurement costs c) Storage costs	calle b) d)	d as Set-up costs None of above
11)	 Constraints in an LP model representa a) Limitations b) Requirements c) Balancing limitations and required d) All of these 	ts ment	
12)	Simple linear programming problem solved by the graphical method. a) One Decision c) Three Decision	with _ b) d)	variables can be easily Four Decision Two Decision
13)	For a maximization problem the object artificial variable a) + M c) Zero	ctive f b) d)	function coefficient for an - M None of the options
14)	What is also defined as the non-nega LHS of the constraint to convert the i	ative v nequa	variables which are added in the ality \leq into an equation?

- a) Slack Variable
 - b)

c) Key Element

Simplex Algorithm None of the above d)

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and Question No. 6 are compulsory.

2) Attempt any two questions out of Q. 3, 4, 5.

- 3) Attempt any two questions out of Q. 7, 8, 9.
- 4) Assume suitable data whenever required.
- 5) Use of non-programmable calculator is allowed.

Section I

- **Q.2 a)** What is linear programming model? Write General form of linear programming model.
 - b) A company manufactures two types of chairs types A and types B. Both types of chairs pass through three processes. Shaping, setting and finishing. The standard manhours for each process per unit and available manhours for each department are given in the table below.

	Departments					
Chairs	Shaping	Setting	Finishing			
	Processi	ing time pe	r unit (hrs)			
A	6	2	3.6			
В	4	4	4			
Available Manhours	3600	2000	3600			

The availability of wood is sufficient to produce 500 nos. of chairs of types A and 400 nos. of chairs of type B. Each chair of type A gives a profit of Rs. 25/- While each chair of type B gives a profit of Rs. 20/-.

Formulate the L.P. Model and find graphically the quantity of each type of chairs to be produced to maximize the profit

Q.3 Find the shortest distance between node (1) & node (7)



Max. Marks: 56

Set

SLR-FM-105

08

Set | R

Q.4 Solve the following transportation model using least cost method & whether 08 further optimization using "MODI" is possible? If further optimizations possible then optimize it further.

Supply	Dist	ributio	Supply		
Points	D ₁	D ₂	D ₃	D_4	Capacity
O ₁	1	2	1	4	30
O ₂	3	3	2	1	50
O ₃	4	2	5	9	20
Requirement	20	40	30	10	

Q.5 Analyse the function $f(x) = x^2 + 5x + 6$ and classify the stationary point as 08 maxima / minina /point of inflection.

Section – II

- Q.6 What is decision tree? How it is to be used in decision making process. 04 a) 80
 - b) Solve the game graphically.

- Q.7 A particular item has a demand 15000 units per year. The cost of one 80 procurements is Rs. 200 and holding cost per unit is Rs.4 per year. The replacement is instantaneous and no shortages are allowed. Determine.
 - The economic lot size. 1)
 - 2) The number of orders per year.
 - 3) The time between two orders.
 - 4) The total cost per year of the cost of one unit is Rs. 2.
- What is integer programming? What are its types? Q.8 a) 03
 - Write general form of integer programming model. b)
- Q.9 Using artificial neural network technique find out output for following network 80 using binary (0,1) and bipolar (-1,1) activation function.



B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

OPTIMIZATION TECHNIQUES

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question no. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one marks.

2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget To mention, Q.P. Set (P/Q/R/S) on Top of Page.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In Vogel's Approximation Method, the opportunity cost associated with a 1) row is determined by _
 - a) The difference between the smallest cost and next smallest cost in the row.
 - b) The difference between the smallest unused cost and the next smallest unused cost the row.
 - c) The difference between the smallest cost and the next smallest unused cost in the row.
 - d) None of these
 - 2) Which of the following criteria for decision making uses pessimistic decisions?
 - a) Minimax Maximin b)
 - c) Laplace d) Hurwicz
 - Neural Networks are complex _____ with many parameters. 3)
 - a) Linear functions b) Non-linear functions c) Discrete Functions **Exponential Functions** d)

EOQ is a (an) _____ inventory system. 4)

a) Periodic b) Continuous c) Optimal d) Economic

5) The inventory carrying costs are also called as _____.

- a) Procurement costs b) Set-up costs
- c) Storage costs d) None of above
- Constraints in an LP model represents _____. 6)
 - a) Limitations
 - b) Requirements
 - c) Balancing limitations and requirement
 - d) All of these
- Simple linear programming problem with _____ variables can be easily 7) solved by the graphical method.
 - a) One Decision c) Three Decision d) Two Decision



Marks: 14

Set

Max. Marks: 70

SLR-FM-105

Duration: 30 Minutes

Seat

No.

artificial variable _____. a) + M b) - M None of the options c) Zero d) LHS of the constraint to convert the inequality ' \leq ' into an equation? a) Slack Variable Simplex Algorithm b) c) Key Element None of the above d) Which variables are fictitious and cannot have any physical meaning? a) Optimal Variable **Decision Variable** b) c) Artificial Variable None of the above d) A basic solution which also satisfies the condition in which all basic variables are non-negative is called a) Basic feasible solution b) Feasible solution c) Optimal solution None of the above d) To find the optimal solution, we apply a) LPP b) VAM c) MODI method d) Rim VAM stands for . a) Vogeal's Approximation method b) Vegeal's Approximate method

- c) Vangel's Approximation method
- d) Vodel's Approximation method
- Games with saddle point are _____ in the nature. 14)
 - a) Deterministic b)
 - c) Stochastic

11)

12)

13)

Probabilistic d) Normative

- 8) For a maximization problem the objective function coefficient for an
- 9) What is also defined as the non-negative variables which are added in the
- 10)

SLR-FM-105

Set S

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Question No. 2 and Question No. 6 are compulsory.

2) Attempt any two questions out of Q. 3, 4, 5.

- 3) Attempt any two questions out of Q. 7, 8, 9.
- 4) Assume suitable data whenever required.
- 5) Use of non-programmable calculator is allowed.

Shaping

6

4

3600

Section I

- Q.2 a)What is linear programming model? Write General form of linear04programming model.04
 - b) A company manufactures two types of chairs types A and types B. Both types of chairs pass through three processes. Shaping, setting and finishing. The standard manhours for each process per unit and available manhours for each department are given in the table below.

Departments

Finishing

3.6

4

3600

Setting

Processing time per unit (hrs)

2

4

2000

The sublick little of superline officient to produce 500 years of chains of the set
The availability of wood is sufficient to produce 500 nos. of chairs of types
A and 400 nos. of chairs of type B. Each chair of type A gives a profit of
Rs. 25/- While each chair of type B gives a profit of Rs. 20/

Formulate the L.P. Model and find graphically the quantity of each type of chairs to be produced to maximize the profit

Q.3 Find the shortest distance between node (1) & node (7)

Chairs

A

В

Available

Manhours



Max. Marks: 56

Set

S Set

Q.4 Solve the following transportation model using least cost method & whether 08 further optimization using "MODI" is possible? If further optimizations possible then optimize it further.

Supply	Dist	ributio	Supply		
Points	D ₁	D ₂	D ₃	D_4	Capacity
O ₁	1	2	1	4	30
O ₂	3	3	2	1	50
O ₃	4	2	5	9	20
Requirement	20	40	30	10	

Q.5 Analyse the function $f(x) = x^2 + 5x + 6$ and classify the stationary point as 08 maxima / minina /point of inflection.

Section – II

- Q.6 What is decision tree? How it is to be used in decision making process. 04 a) 80
 - b) Solve the game graphically.

- Q.7 A particular item has a demand 15000 units per year. The cost of one 80 procurements is Rs. 200 and holding cost per unit is Rs.4 per year. The replacement is instantaneous and no shortages are allowed. Determine.
 - The economic lot size. 1)
 - 2) The number of orders per year.
 - 3) The time between two orders.
 - 4) The total cost per year of the cost of one unit is Rs. 2.
- What is integer programming? What are its types? Q.8 a) 03
 - Write general form of integer programming model. b)
- Q.9 Using artificial neural network technique find out output for following network 80 using binary (0,1) and bipolar (-1,1) activation function.



Seat No.								Set	Ρ
		В	.E. (Part	- II) (CGPA) Civil E	Exami Engine	nati erin	on Nov/Dec-2019 g		
				DISASTER	MANA	AGE	MENT		
Day &	Date	e: Tue	esday, 26-1	1-2019			Μ	lax. Marks	: 70
Instru		ns:1)	Q. No. 1 is	compulsory an	d shoul	d be :	solved in first 30 minut	es in ansv	ver
			book.						
		2) I	Figures to t	he right indicate	e full ma	arks.			
Durati	on 3	0 Min	outes	MCQ/Objecti	veiyp	e Que	estions	Marks	· 14
Q.1	Cho	ose t	he correct	alternatives fr	om the	opti	ons and rewrite the	marite	14
	sent	ence	•			•			
	1)	Lanc a) b) c) d)	Islides occu Intensity o Steep Slop Deforestat All of the a	Irs due to f Rainfall Des ion leading it so bove	 oil erosi	on			
	2)	The	National In	stitute of Disast	ter Mana	agem	ent (NIDM) is at	_•	
		a) C)	Chennai			d)	Kolkata		
	3)	Tsur a) c)	ami is clas Water Haz Biological	sified as ard hazard		b) d)	Environmental hazaro Geological hazard	ł	
	4)	The a) b) c) d)	nodal depa Indian met Indian met Indian met None of th	rtment for wind eorological dep rological depar allurgical depa ese	detection detection dartment rtment rtment	on IN it	ID refers to		
	5)	For g a) b) c) d)	good land u above the above the based on t building. above the	se planning, bu 1 in 100 year fl level of the Pro the chance and level of the larg	uildings lood lev bable N l consec gest hist	shou el /laxim quenc torica	ld be built <u>.</u> num Flood es of a flood for that p I flood	articular	
	6)		drought o	correlates the s	upply a	nd de	mand of goods with th	e all	
		otne a) c)	Meteorolo Agricultura	gical drought al drought		b) d)	Hydrological drought Socio-economic drou	ght	
	7)	a) c)	is ash fr Lahars Debris flow	om a volcanic r /	nixer wi	th wa b) d)	ter to form a thick rive Solification Creep	r of mud.	
	8)	Rich [:] a) c)	ter scale is logarithmic volumetric	a c scale scale		b) d)	calculus scale area to vibration ratio	scale	

- 9) The first step in preparedness planning is _____.
 - Analysis of data collected a)
 - Determination of objectives b)
 - Development of implementing device C)
 - Determination of strategy d)
 - 10) Disaster Management act was enforceable since_____.
 - 2001 2003 a) b)
 - C) 2005 d) 2007
 - Responsibility for securing the scene, preserving life and treating the 11) wounded is the responsibility of _____.
 - a) first responders
 - district disaster management department b)
 - state government C)
 - d) none of these
 - 12) Which of the followings is categorized under a natural meteorological disaster?
 - Earthquake a)
- b) Tsunamis

Set P

- Tornadoes c) d) Landslides
- Who heads the National Crisis Management Committee? 13)
 - Prime Minister President a) b) Ministry of Environment d)
 - C) Cabinet Secretary
- 14) Which of the following statements is/are correct about National disaster response force?
 - The parent agency of National Disaster Management Authority is i) Ministry of Home Affairs.
 - The Chairman of the NDMA is Home Minister. ii)
 - Only I b) Only II a)
 - Both I & II d) None c)

		SLR-FM-1	06				
Seat No.		Set	Ρ				
		B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT					
Day & Time:	Date 02:3	e: Tuesday, 26-11-2019 Max. Marks 0 PM To 05:30 PM	: 56				
Instru	ctio	 ns: 1) Question No.5 from Section - I is Compulsory. Solve any two Questions from Remaining questions. 2) Question No.9 from Section – II is Compulsory. Solve any two question From remaining questions. 3) Figures to right indicate full marks. 	ns				
• •		Section - I					
Q.2	a)	Define:1)Risk2)Vulnerability3)Hazards4)Disasters	04				
	b)	How will you define environmental hazards and Environmental disasters? Explain both in brief.	05				
Q.3	a) b)	Define Volcanic Eruptions? Also discuss causes of volcanic eruptions. What are the causes of Landslides? Discuss its damage assessment process in brief.					
Q.4	a) b)	Discuss the mechanism and forms of soil erosion? Write a note on: Wars and Chemical Disasters.	04 05				
Q.5	a)	What do you mean by land use map? How it is helpful in disaster management activities?	04				
	b)	Define a disaster management cycle? Describe its phases in short.	06				
0.6	-)	Section – II	04				
Q.0	a) b)	activities?	04				
Q.7	ы) а)	Discuss the importance of information and communication in disaster	03				
	b)	mitigation? "Social Media plays a vital role in disaster management process". Give your comment on his statement with justification?					
Q.8	Cor a di to th	nsider a drought disaster circumstances in certain region of your state, being saster manager. how will you manage this disaster? Discuss with reference ne Disaster Management Cycle.	09				
Q.9	a) b)	What is the role of NDMA disaster management activities? What are the roles and responsibilities of District Magistrate in disaster management?	04 06				

Page **3** of **12**

R	-F	М-	.1(76	

							S	LR-F	M-1	06
Seat No.								ļ	Set	Q
		В	.E. (Part	- II) (CGPA) Exa Civil Eng	aminati Jineerin	on N g	lov/Dec-20 T	19		
DIGAGIER MANAGEMENI Day & Date: Tuesday, 26-11-2019 Max. Marks: 70 Time: 02:30 PM To 05:30 PM									: 70	
Instru	Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.2) Figures to the right indicate full marks.									
Duratio	-n. 3	0 Min		MCQ/Objective	Type Qu	estion	IS	г	Marks	· 1/
Q1	Cho	ose t	he correct	alternatives from	the onti	ons a	nd rewrite th	' Ne	viaina	1 <u>4</u>
ц.,	sent	ence			i iiio opii	ene a				••
	1)	Rich a) c)	ter scale is logarithmic volumetric	a c scale scale	b) d)	calcu area	ulus scale to vibration ra	atio scal	е	
2	2)	The a) b) c) d)	first step in Analysis o Determina Developm Determina	preparedness plan f data collected tion of objectives ent of implementin tion of strategy	nning is _ ng device					
ć	3)	Disa a) c)	ster Manag 2001 2005	ement act was enf	forceable b) d)	since 2003 2007	<u>.</u> }			
4	 Responsibility for securing the scene, preserving life and treating the wounded is the responsibility of 									
		a) b) c) d)	first respondistrict district district district district district district district distribution of the none of the	nders aster management rnment ese	t departm	ient				
5	5)	Whic disas a) c)	ch of the fol ster? Earthquak Tornadoes	lowings is categori e s	ized unde b) d)	er a na Tsun Land	itural meteoro namis Islides	ological		
6	6)	Who a) c)	heads the Prime Min Cabinet Se	National Crisis Ma ister ecretary	inagemer b) d)	nt Corr Presi Minis	nmittee? dent try of Environ	iment		
7	 7) Which of the following statements is/are correct about National disaster response force? i) The parent agency of National Disaster Management Authority is Ministry of Home Affairs. ii) The Chairman of the NDMA is Home Minister. 									

- a) Only I b) Only II c) Both I & II d) None
- Page **4** of **12**

8) Landslides occurs due to .

- Intensity of Rainfall a)
- **Steep Slopes** b)
- Deforestation leading it soil erosion C)
- All of the above d)
- 9) The National Institute of Disaster Management (NIDM) is at _____. Mumbai
 - New Delhi a) Chennai
 - d) Kolkata
- Tsunami is classified as _____. 10)
 - Water Hazard a)

C)

11)

b) Environmental hazard

SLR-FM-106

Set Q

- **Biological hazard** c) d)
- Geological hazard The nodal department for wind detection IMD refers to _____.

b)

- a) Indian meteorological department
 - Indian metrological department b)
 - Indian metallurgical department c)
 - d) None of these
- For good land use planning, buildings should be built _____. 12)
 - above the 1 in 100 year flood level a)
 - b) above the level of the Probable Maximum Flood
 - based on the chance and consequences of a flood for that particular C) building.
 - d) above the level of the largest historical flood
- _____ drought correlates the supply and demand of goods with the all 13) other droughts.
 - Hydrological drought b)
 - Agricultural drought C)

Meteorological drought

- Socio-economic drought d)
- _ is ash from a volcanic mixer with water to form a thick river of mud.
- 14) Lahars a)

a)

Solification b)

c) Debris flow d) Creep

Seat No.		Set	Q							
	B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT									
Day & Date: Tuesday, 26-11-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM										
 Instructions: 1) Question No.5 from Section - I is Compulsory. Solve any two Questions from Remaining questions. 2) Question No.9 from Section – II is Compulsory. Solve any two questions From remaining questions. 3) Figures to right indicate full marks 										
		Section - I								
Q.2	a)	Define: 1) Risk 2) Vulnerability	04							
	b)	 Hazards 4) Disasters How will you define environmental hazards and Environmental disasters? Explain both in brief. 	05							
Q.3	a) b)	Define Volcanic Eruptions? Also discuss causes of volcanic eruptions.04What are the causes of Landslides? Discuss its damage assessment05process in brief.05								
Q.4	a) b)	Discuss the mechanism and forms of soil erosion?04Write a note on: Wars and Chemical Disasters.05								
Q.5	a)	What do you mean by land use map? How it is helpful in disaster 0 management activities?								
	b)	Define a disaster management cycle? Describe its phases in short.	06							
		Section – II								
Q.6	a)	Discuss the role of seismological observatories in disaster mitigation activities?	04							
	b)	Write a note on : Forecasting and warning systems of disasters.	05							
Q.7	a)	Discuss the importance of information and communication in disaster mitigation?	04							
	b)	"Social Media plays a vital role in disaster management process". Give your comment on his statement with justification?	05							
Q.8	Cor a di to t	nsider a drought disaster circumstances in certain region of your state, being saster manager. how will you manage this disaster? Discuss with reference he Disaster Management Cycle.	09							
Q.9	a) b)	What is the role of NDMA disaster management activities? What are the roles and responsibilities of District Magistrate in disaster management?	04 06							

SLR-FM-106

Seat							Sat	D
No.							Sel	Γ
		В	E. (Part	- II) (CGPA) E>	kaminati	on Nov/Dec-2019		
					GINEERIN	g Ment		
Day &	Date	· Tuc	anday 26-1	1-2010	IANAGE		Max Marks	
Time:	02:30) PM	To 05:30 P	'M		I	viax. Iviai KS	5.70
Instru	ctior	is: 1)	Q. No. 1 is	compulsory and	should be	solved in first 30 minu	utes in ansv	ver
			book.					
		2) I	Figures to the	he right indicate f	ull marks.	estions		
Duratio	on: 3	0 Min	nutes		i ype Qui	5110115	Marks	: 14
Q.1	Cho	ose t	he correct	alternatives fror	n the opti	ons and rewrite the		14
	sent	ence			•			
	1)	For g	good land u	se planning, build	dings shou	ld be built		
		a) b)	above the	level of the Proba	able Maxim	num Flood		
		c)	based on t	he chance and co	onsequenc	ces of a flood for that	particular	
		-1)	building.		- 4 - : - 4	l fla a d		
	•	a)	above the	level of the larges	st historica			
	2)	othe	_ drought (r droughts	correlates the sup	oply and de	emand of goods with t	he all	
		a)	Meteorolog	gical drought	b)	Hydrological drough	t	
		c)	Agricultura	al drought	d)	Socio-economic dro	ught	
	3)		_ is ash fro	om a volcanic mix	ker with wa	ter to form a thick rive	er of mud.	
		a)	Lahars Debris flow	1	b)	Solification		
	4)	C) Rich	ter scale is	a	u)	Oleep		
	')	a)	logarithmic	c scale	b)	calculus scale		
		c)	volumetric	scale	d)	area to vibration ratio	o scale	
	5) The first step in preparedness planning is							
		a)	Analysis o	f data collected				
		c)	Developm	ent of implementi	na device			
		d)	Determina	tion of strategy	5			
(6) Disaster Management act was enforceable since							
		a)	2001		b)	2003		
	_,	C)	2005		a)	2007		
	 Responsibility for securing the scene, preserving life and treating the wounded is the responsibility of 							
		a)	first respon	nders				

- district disaster management department b)
- state government none of these c)
- d)

SLR-FM-106

a) Earthquake C)

- Tsunamis b)
- Tornadoes
- d) Landslides

Only II

SLR-FM-106

Set | R

- Who heads the National Crisis Management Committee? 9)
 - Prime Minister b) President a)
 - Cabinet Secretary d) Ministry of Environment C)
- 10) Which of the following statements is/are correct about National disaster response force?
 - i) The parent agency of National Disaster Management Authority is Ministry of Home Affairs.
 - The Chairman of the NDMA is Home Minister. ii)
 - Only I b) a)
 - Both I & II d) None c)
- Landslides occurs due to _____. 11)
 - Intensity of Rainfall a)
 - **Steep Slopes** b)
 - Deforestation leading it soil erosion C)
 - All of the above d)

The National Institute of Disaster Management (NIDM) is at _____. 12) Mumbai

- New Delhi b) a)
- C) Chennai d) Kolkata
- Tsunami is classified as _____. 13)
 - Water Hazard a)

C)

- b) Environmental hazard
- Biological hazard
- d) Geological hazard
- 14) The nodal department for wind detection IMD refers to _____.
 - Indian meteorological department a)
 - Indian metrological department b)
 - Indian metallurgical department C)
 - None of these d)

Seat No.							Set	R		
	B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT									
Day & Time: (Day & Date: Tuesday, 26-11-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM									
 Instructions: 1) Question No.5 from Section - I is Compulsory. Solve any two Questions from Remaining questions. 2) Question No.9 from Section – II is Compulsory. Solve any two questions From remaining questions. 3) Figures to right indicate full marks 										
			Sect	ion – I						
Q.2	a)	Define: 1) Risk		2)	Vulr	nerability		04		
	b)	 Hazards How will you def Explain both in b 	fine environmenta orief.	4) I hazards	Disa and	asters Environmer	tal disasters?	05		
Q.3	a) b)	Define Volcanic Eruptions? Also discuss causes of volcanic eruptions. 04 What are the causes of Landslides? Discuss its damage assessment 05 process in brief.						04 05		
Q.4	a) b)	Discuss the mechanism and forms of soil erosion? 04 Write a note on: Wars and Chemical Disasters. 05								
Q.5	a)	What do you mean by land use map? How it is helpful in disaster (management activities?						04		
	b)	Define a disaster management cycle? Describe its phases in short.						06		
			Se	ection – II	I					
Q.6	a)	Discuss the role activities?	of seismological	observato	ories i	n disaster n	nitigation	04		
	b)	Write a note on a	: Forecasting and	warning s	syste	ms of disast	ers.	05		
Q.7	a)	Discuss the import mitigation?	ortance of informa	ation and	comn	nunication i	n disaster	04		
	b)	"Social Media pl your comment o	lays a vital role in o on his statement w	disaster n ith justific	mana(cation	gement proo ?	cess". Give	05		
Q.8	Con a di to th	sider a drought d saster manager. I ne Disaster Manag	lisaster circumstar how will you mana gement Cycle.	nces in ce age this di	ertain isaste	region of yo er? Discuss	our state, being with reference	09		
Q.9	a) b)	What is the role What are the rol management?	of NDMA disaster les and responsibi	manage lities of D	ment District	activities? Magistrate	in disaster	04 06		

		В	.E. (Part - II) (CGPA) Exami	inati	on Nov/Dec-2019		
			DISASTER MAN	AGE	9 MENT		
Day Time	& Date : 02:30	e: Tue 0 PM	esday, 26-11-2019 To 05:30 PM		Max. Marks: 70		
Instr	uctior	ns: 1)	Q. No. 1 is compulsory and shoul	ld be	solved in first 30 minutes in answer		
		2) F	Figures to the right indicate full ma	arks. e Qu	estions		
Dura	tion: 3	0 Min	lutes	U QU	Marks: 14		
Q.1	Cho	ose ti ence	he correct alternatives from the	e opti	ons and rewrite the 14		
	1)	Disa: a) c)	ster Management act was enforce 2001 2005	eable b) d)	since 2003 2007		
	 Responsibility for securing the scene, preserving life and treating the wounded is the responsibility of 						
		a) b) c) d)	district disaster management dep state government none of these	oartm	ent		
	3)	Whic disas	th of the followings is categorized ster?	unde	r a natural meteorological		
		a) c)	Tornadoes	d)	Landslides		
	4)	Who	heads the National Crisis Manag	emer	nt Committee? President		
		c)	Cabinet Secretary	d)	Ministry of Environment		
	5)	Whic respo i)	th of the following statements is/a onse force? The parent agency of National D Ministry of Home Affairs	re co isaste	rrect about National disaster er Management Authority is		
ii) The Chairman of the NDMA is Home Minister.							
		a) c)	Only I Both I & II	b) d)	Only II None		
	6)	Land a) b) c) d)	Islides occurs due to Intensity of Rainfall Steep Slopes Deforestation leading it soil eros All of the above	ion			
	7)	The l a) c)	National Institute of Disaster Man New Delhi Chennai	agem b) d)	ient (NIDM) is at Mumbai Kolkata		

Seat No.

Set S

SLR-FM-106

- 8) Tsunami is classified as _____.
 - a) Water Hazard

b) Environmental hazard

SLR-FM-106

Set S

- c) Biological hazard
- d) Geological hazard
- 9) The nodal department for wind detection IMD refers to _____.
 - a) Indian meteorological department
 - b) Indian metrological department
 - c) Indian metallurgical department
 - d) None of these
- 10) For good land use planning, buildings should be built_____.
 - a) above the 1 in 100 year flood level
 - b) above the level of the Probable Maximum Flood
 - c) based on the chance and consequences of a flood for that particular building.
 - d) above the level of the largest historical flood
- 11) _____ drought correlates the supply and demand of goods with the all other droughts.
 - a) Meteorological droughtc) Agricultural drought
- b) Hydrological drought
- d) Socio-economic drought
- _____ is ash from a volcanic mixer with water to form a thick river of mud.
- a) Lahars

12)

- c) Debris flow
- b) Solificationd) Creep
- 13) Richter scale is a _____.
 - a) logarithmic scalec) volumetric scale
- b) calculus scale
- d) area to vibration ratio scale
- 14) The first step in preparedness planning is _____.
 - a) Analysis of data collected
 - b) Determination of objectives
 - c) Development of implementing device
 - d) Determination of strategy
| No. | | Sei | Э |
|--------|----------------------|--|----------|
| | | B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 | |
| | | Civil Engineering | |
| Dov 8 | Dot | | 56 |
| Time: | 02:3 | 80 PM To 05:30 PM | . 50 |
| Instru | ctio | ns: 1) Question No.5 from Section - I is Compulsory. Solve any two | |
| | | Questions from Remaining questions. | ne |
| | | From remaining questions. | 15 |
| | | 3) Figures to right indicate full marks. | |
| | | Section - I | |
| Q.2 | a) | Define: | 04 |
| | | 3) Hazards 4) Disasters | |
| | b) | How will you define environmental hazards and Environmental disasters?
Explain both in brief. | 05 |
| Q.3 | a) | Define Volcanic Eruptions? Also discuss causes of volcanic eruptions. | 04 |
| | D) | process in brief. | 05 |
| Q.4 | a)
b) | Discuss the mechanism and forms of soil erosion?
Write a note on: Wars and Chemical Disasters. | 04
05 |
| Q.5 | a) | What do you mean by land use map? How it is helpful in disaster
management activities? | 04 |
| | b) | Define a disaster management cycle? Describe its phases in short. | 06 |
| | | Section – II | |
| Q.6 | a) | Discuss the role of seismological observatories in disaster mitigation activities? | 04 |
| | b) | Write a note on : Forecasting and warning systems of disasters. | 05 |
| Q.7 | a) | Discuss the importance of information and communication in disaster
mitigation? | 04 |
| | b) | "Social Media plays a vital role in disaster management process". Give your comment on his statement with justification? | 05 |
| Q.8 | Cor
a di
to th | nsider a drought disaster circumstances in certain region of your state, being saster manager. how will you manage this disaster? Discuss with reference he Disaster Management Cycle. | 09 |
| Q.9 | a)
b) | What is the role of NDMA disaster management activities?
What are the roles and responsibilities of District Magistrate in disaster
management? | 04
06 |

Page **12** of **12**

SLR-FM-106



Set S

Seat No.

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory should be solved in first 30 minutes in answer book

- 2) Answer MCQ Objective type questions on page no. 3 only. Don't forget to mention, QP. Set (P/Q/R/S) on Top of Page.
- 3) Use of Non programmable scientific calculator is allowed.
- 4) Assume suitable data if necessary and mention clearly.
- Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The compressive strength of concrete after 7 days of curing (Shall not be 1) less than) times.
 - 1 3 2 a) b) 2 c) $\frac{2}{3}$ 1 d)
- 2) The choice of mix proportion of a concrete is independent of _____.
 - a) grade designation
 - b) maximum size of aggregate
 - c) minimum water content ratio
 - d) batching, mixing, placing and compaction techniques
- 3) The setting and hardening of cement after addition of water is due to _____.
 - a) The presence of gypsum
 - b) Binding action of water
 - c) Hydration of some of constituent compounds of cement
 - d) Evaporation of water
 - e) None of the above
- 4) Permeability of concrete reduces with _____.
 - a) Decrease in water cement ratio
 - Decrease in porosity b)
 - c) Increase in strength of cement
 - d) All of the above
- 5) IS provision of concrete mix is given in ____
 - a) IS- 10262-2009 b) IS-383-1970
 - c) IS- 456-2000 d) IS-4031-1968
- Air entraining agents _ 6)
 - a) Are used for entraining air in concrete
 - b) Contain wood resins, fats and lignosalfonates
 - c) Increase durability of concrete to frost action
 - d) All of the above



Max. Marks: 70

Marks: 14

				Set	Ρ
7)	Ble a) b) c) d) e)	eding of concrete is said to occur Finer particles settle down at the Coarser particles get separated Cement paste rises to the surface Finer particles collect in isolated None of the above	s whe bott ce of pock	en om concrete kets	
8)	Ree woi a) c)	commended slump value as per l rkability of concrete is between 100-150 50-100	S 450 b) d)	6-2000 for high degree of mm. 25-75 less than 50	
9)	The to t a) c)	e compressive strength of 43 Gra be more than 16Mpa 27.5Mpa	de O b) d)	PC after three days is expected 23Mpa 33Mpa	
10)	The a) c)	e Standard size of concrete cube 50 mm 70.07 mm	for co b) d)	ompressive strength is 150 mm 175 mm	
11)	Ter a) c)	The strength of concrete can be $500\sqrt{fck}$ $0.7\sqrt{fck}$	expre b) d)	essed as 5000 \sqrt{fck} 7 \sqrt{fck}	
12)	The a) c)	e workability of concrete by slump mm ³ /h mm/h	b test b) d)	is expressed as mm²/h mm	
13)	The a) b) c) d)	e fineness modulus Is a numerical index of fineness Gives some idea of the mean si body of aggregate Is a sum of the cumulative perce specified sieves divided by 100 All of the above	ze of entag	particles present in the entire es retained on the set of	
14)	The a)	e nominal mix corresponding to N 1:2:4	120 gi b)	rade concrete is 1:3:6	

c) 1:1.5:3 d) 1:1:2

SLR-FM-11

	CONCRETE TECHNOLOGY	
Day a Time	& Date: Saturday, 07-12-2019 10:00 AM To 01:00 PM	Max. Marks
Instr	 Juctions: 1) All questions are compulsory. 3) Use of Non – programmable scientific calculator is allowed 4) Assume suitable data if necessary and mention clearly. 5) Figures to the right indicate full marks. 	
	Section – I	
Q.2	 Attempt any two questions from the following. a) What are IS specification for water to be used for making concrete b) Explain effect of water cement ratio on strength of concrete. c) Explain various admixtures in concrete and their necessity. 	e?
Q.3	 Attempt any four questions from the following. a) Write a note on initial and final setting time of cement. b) Draw detailed flow chart of cement manufacturing by dry process c) Explain compaction factor test for measuring workability. d) Write a note on segregation and bleeding. e) Explain high strength concrete. 	5.
	Section - II	
Q.2	 Write a note on any Four of following. a) Durability concrete b) Light weight concrete c) High performance concrete d) Quality control of concrete e) Nominal Mix and Design Mix 	
Q.3	 Design a concrete mix of grade M25 as per ACI method. Using the following data: Concrete is to be used for Elevated water tank Exposure condition - Moderate. Standard deviation = 4 K Himsworth Constant = 1.65 Cement to be used - O.P.C. 43 grade Workability required - 50 mm Slump Method of concrete placing - Manual (Pumping is not required) Maximum size of aggregate - 20 mm (Crushed angular) Test data for material:- a) Specific gravity of materials are cement= 3.15, F.A. = 2.65 and C 2.80 b) The dry rodded bulk densities of C. A. = 1600 Kg/ m³ c) Water absorption of FA = 2% and CA = 1%. 	5. A. =

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019

Seat

No.

(

Q.2	Write a note on any Four of following.	

- d) Fineness modulus of FA = 2.8.

Refer the Table no. 1 to 6 given below.

OR

Write a step by step procedure of designing concrete mix by IS method.

SLR-FM-11



12

16

12

16

s: 56

16

SLR-FM-11 Set P

Table – 1

: Relation between water/cement ratio and average compressive strength of concrete, according to ACI 211.1-91

Average Compressive strength at 28 day	Effective water/cement ratio (by mass)		
(MPa)	Non-air entrained concrete	Air entrained concrete	
45	0.38		
40	0.43		
35	0.48	0.40	
30	0.55	0.46	
25	0.62	0.53	
20	0.70	0.61	
15	0.80	0.71	

Table – 2

: Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions

Table 11.6. Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions					
Exposure Condition	Maximum W/C ratio, normal density aggregate concrete	Minimum design strength, low density aggregate concrete			
i. Concrete Intended to be Watertight	-	(MPa)			
(a) Exposed to fresh water	0.50	25			
(b) Exposed to brackish or sea water	0.45	30			
ii. Concrete exposed to freezing and thawing					
(a) Kerbs, Gutters, Guard rails or thin sections	0.45	30			
(b) Other elements	0.50	25			
(c) in presence of de-icing chemicals	0.45	30			
iii. For corrosion protection of reinforced concrete exposed to de- icing salts, brackish water, sea water or spray from these sources	0.40	33			

Table - 3

: Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91

Table 11.7. Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91				
Types of Construction	Range of Slump (mm)			
Reinforced foundation walls and footings	20-80			
Plain footings, Caissons and substructure walls	20-80			
Beams and reinforced walls	20-100			
Building columns	20-100			
Pavements and slabs	20-80			
Mass Concrete	20-80			

Table – 4

: Approximate requirement for mixing water and air content for different workability and nominal maximum size of Aggregate according to ACI 211.1-91

Workability or content	water con	ntent, Kg/n	n ¹ of concr	ete for ind (mm)	licated ma	aximum	aggrega	te size
mm	10	12.5	20	25	40	50	70	150
Slump (mm)	-		Non-aii	entrained	concrete	6		
30-50	205	200	185	180	160	155	145	125
80-100	225	215	200	195	175	170	160	140
150-180	240	230	210	205	185	180	170	
	3	2.5	2	1.5	1	0.5	0.3	0.2
content %	Air entrained concrete							
		1 244 1		1		r		
30-50	180	1/5	165	160	145	140	135	120
80-100	200	190	180	175	160	155	150	135
150-180	215	205	190	185	170	165	160	(#)
Recommended avg. total air content % Mild Exposure	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00
Moderate Exposure	6.00	5.50	5.00	4.50	4.50	4.00	3.50	3.00
Extreme Exposure	7.50	7.00	6.00	6.00	5.50	5.00	4.50	4.00

Table – 5

Maximum Size of Aggregate	Bulk pe	volume of dry rod r unit volume of c modulus c	ded coarse aggre oncrete for finene of sand of	egate ess
EM.	2.40	2.60	2.80	3.00
10	0.50	0.48	0.46	0.44
12.5	0.59	0.57	0.55	0.53
20	0.66	0.64	0.62	0.60
25	0.71	0.69	0.67	0.65
40	0.75	0.73	0.71	0.69
50	0.78	0.76	0.74	0.72
70	0.82	0.80	0.78	0.76
150	0.87	0.85 ·	0.83	0.81

SLR-FM-11

Set P

SLR-FM-11 Set P

: First Estimate of density (unit weight) of fresh concrete as given by ACI 211.1-91

Maximum size of	First Estimate of density (unit weight) of fresh concrete				
Aggregate (mm)	Non air-entrained (kg/m3)	Air-entrained (kg/m3)			
10	2285	2190			
12.5	2315	2235			
20	2355	2280			
25	2375	2315			
40	2420	2355			
50	2445	2375			
70	2465	2400			
150	2505	2435			

Max. Marks: 70

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory should be solved in first 30 minutes in answer book

- 2) Answer MCQ Objective type questions on page no. 3 only. Don't forget to mention, QP. Set (P/Q/R/S) on Top of Page.
- 3) Use of Non programmable scientific calculator is allowed.
- 4) Assume suitable data if necessary and mention clearly.
- Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1

Marks: 14 Choose the correct alternatives from the options and rewrite the sentence. 14

- Recommended slump value as per IS 456-2000 for high degree of 1) workability of concrete is between mm. a) 100-150 b) 25-75 c) 50-100 d) less than 50
 - The compressive strength of 43 Grade OPC after three days is expected 2) to be more than _____.
 - a) 16Mpa b) 23Mpa c) 27.5Mpa d) 33Mpa
 - 3) The Standard size of concrete cube for compressive strength is _____.
 - 150 mm a) 50 mm b)
 - c) 70.07 mm d) 175 mm
 - Tensile strength of concrete can be expressed as _____. 4)
 - a) $500\sqrt{fck}$ b) $5000\sqrt{fck}$ c) $0.7\sqrt{fck}$ d) $7\sqrt{fck}$
 - The workability of concrete by slump test is expressed as _____. 5)
 - mm^2/h a) mm^3/h b)
 - c) mm/h d) mm
 - The fineness modulus _____ 6)
 - a) Is a numerical index of fineness
 - b) Gives some idea of the mean size of particles present in the entire body of aggregate
 - Is a sum of the cumulative percentages retained on the set of C) specified sieves divided by 100
 - d) All of the above
 - The nominal mix corresponding to M20 grade concrete is _____. 7)
 - 1:3:6 a) 1:2:4 b)
 - c) 1:1.5:3 d) 1:1:2



Set	Q

- 8) The compressive strength of concrete after 7 days of curing (Shall not be less than) _____ times. 3 2
 - $\frac{1}{2}$ a) b)
 - $\frac{2}{3}$ C) d)
 - $\frac{1}{3}$
- 9) The choice of mix proportion of a concrete is independent of _____.
 - a) grade designation
 - b) maximum size of aggregate
 - c) minimum water content ratio
 - d) batching, mixing, placing and compaction techniques
- The setting and hardening of cement after addition of water is due to _____. 10)
 - The presence of gypsum a)
 - b) Binding action of water
 - c) Hydration of some of constituent compounds of cement
 - d) Evaporation of water
 - e) None of the above
- 11) Permeability of concrete reduces with _____.
 - Decrease in water cement ratio a)
 - b) Decrease in porosity
 - c) Increase in strength of cement
 - d) All of the above

12) IS provision of concrete mix is given in _

- a) IS-10262-2009 IS-383-1970 b)
- c) IS- 456-2000 d) IS-4031-1968
- 13) Air entraining agents
 - a) Are used for entraining air in concrete
 - b) Contain wood resins, fats and lignosalfonates
 - c) Increase durability of concrete to frost action
 - d) All of the above
- Bleeding of concrete is said to occurs when _____. 14)
 - a) Finer particles settle down at the bottom
 - b) Coarser particles get separated
 - c) Cement paste rises to the surface of concrete
 - d) Finer particles collect in isolated pockets
 - e) None of the above

16

	S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2 Civil Engineering	019
	CONCRETE TECHNOLOGY	
Day a Time	& Date: Saturday, 07-12-2019 :: 10:00 AM To 01:00 PM	Max. Marks: 56
Instr	 uctions: 1) All questions are compulsory. 3) Use of Non – programmable scientific calculator is allowed 4) Assume suitable data if necessary and mention clearly. 5) Figures to the right indicate full marks. 	I.
	Section – I	
Q.2	 Attempt any two questions from the following. a) What are IS specification for water to be used for making concre b) Explain effect of water cement ratio on strength of concrete. c) Explain various admixtures in concrete and their necessity. 	12 te?
Q.3	 Attempt any four questions from the following. a) Write a note on initial and final setting time of cement. b) Draw detailed flow chart of cement manufacturing by dry process c) Explain compaction factor test for measuring workability. d) Write a note on segregation and bleeding. e) Explain high strength concrete. 	16 3.
	Section - II	
Q.2	 Write a note on any Four of following. a) Durability concrete b) Light weight concrete c) High performance concrete d) Quality control of concrete e) Nominal Mix and Design Mix 	12
Q.3	 Design a concrete mix of grade M25 as per ACI method. Using the following data: Concrete is to be used for Elevated water tank Exposure condition - Moderate. Standard deviation = 4 K Himsworth Constant = 1.65 Cement to be used - O.P.C. 43 grade Workability required - 50 mm Slump Method of concrete placing - Manual (Pumping is not required) Maximum size of aggregate - 20 mm (Crushed angular) Test data for material:- a) Specific gravity of materials are cement= 3.15, F.A. = 2.65 and C 2.80 b) The dry rodded bulk densities of C. A. = 1600 Kg/ m³ c) Water absorption of FA = 2% and CA = 1%. d) Fineness modulus of FA = 2.8. 	16 2. A. =

OR

Write a step by step procedure of designing concrete mix by IS method.

Refer the Table no. 1 to 6 given below.

Seat No.

SLR-FM-11

Set | Q

SLR-FM-11 Set Q

Table – 1

: Relation between water/cement ratio and average compressive strength of concrete, according to ACI 211.1-91

Average Compressive strength at 28 day	Effective water/cement ratio (by mass)		
(MPa)	Non-air entrained concrete	Air entrained concrete	
45	0.38		
40	0.43		
35	0.48	0.40	
30	0.55	0.46	
25	0.62	0.53	
20	0.70	0.61	
15	0.80	0.71	

Table – 2

: Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions

Table 11.6. Requirements of ACI 318-89 for W/C ratio and Strength for Specia Exposure conditions			
Exposure Condition	Maximum W/C ratio, normal density aggregate concrete	Minimum design strength, low density aggregate concrete	
i. Concrete Intended to be Watertight	-	(MPa)	
(a) Exposed to fresh water	0.50	25	
(b) Exposed to brackish or sea water	0.45	30	
ii. Concrete exposed to freezing and thawing			
(a) Kerbs, Gutters, Guard rails or thin sections	0.45	30	
(b) Other elements	0.50	25	
(c) in presence of de-icing chemicals	0.45	30	
iii. For corrosion protection of reinforced concrete exposed to de- icing salts, brackish water, sea water or spray from these sources	0.40	33	

Table - 3

: Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91

Table 11.7. Recommended Values of Slump as given by ACI 2	for Various Type of Construction 211.1-91
Types of Construction	Range of Slump (mm)
Reinforced foundation walls and footings	20-80
Plain footings, Caissons and substructure walls	20-80
Beams and reinforced walls	20-100
Building columns	20-100
Pavements and slabs	20-80
Mass Concrete	20-80

SLR-FM-11 Set Q

Table – 4

: Approximate requirement for mixing water and air content for different workability and nominal maximum size of Aggregate according to ACI 211.1-91

Workability or content	water con	ntent, Kg/n	n ¹ of concr	ete for ind (mm)	icated m:	aximum	aggrega	te size
mm	10	12.5	20	25	40	50	70	150
Slump (mm)	_		Non-air	entrained	concrete	6		
30-50	205	200	185	180	160	155	145	125
80-100	225	215	200	195	175	170	160	140
150-180	240	230	210	205	185	180	170	
	3	2.5	2	1.5	1	0.5	0.3	0.2
content %	180	175	Air e	ntrained o	oncrete	140	135	120
30-50	180	175	165	160	145	140	135	120
80-100	200	190	180	175	160	155	150	135
150-180	215	205	190	185	170	165	160	(8)
Recommended avg. total air content % Mild Exposure	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00
Moderate Exposure	6.00	5.50	5.00	4.50	4.50	4.00	3.50	3.00
Extreme Exposure	7.50	7.00	6.00	6.00	5.50	5.00	4.50	4.00

Table – 5

Maximum Size of Aggregate	Bulk pe	volume of dry rod r unit volume of c modulus c	ded coarse aggre oncrete for finene of sand of	egate ess
F.M.	2.40	2.60	2.80	3.00
10	0.50	0.48	0.46	0.44
12.5	0.59	0.57	0.55	0.53
20	0.66	0.64	0.62	0.60
25	0.71	0.69	0.67	0.65
40	0.75	0.73	0.71	0.69
50	0.78	0.76	0.74	0.72
70	0.82	0.80	0.78	0.76
150	0.87	0.85 ·	0.83	0.81

SLR-FM-11 Set Q

Table	-6
-------	----

: First Estimate of density (unit weight) of fresh concrete as given by ACI 211.1-91

ACI 211.1-91				
Maximum size of	First Estimate of density (unit weight) of fresh concrete			
Aggregate (mm)	Non air-entrained (kg/m3)	Air-entrained (kg/m3)		
10	2285	2190		
12.5	2315	2235		
20	2355	2280		
25	2375	2315		
40	2420	2355		
50	2445	2375		
70	2465	2400		
150	2505	2435		

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory should be solved in first 30 minutes in answer book

- 2) Answer MCQ Objective type questions on page no. 3 only. Don't forget to mention, QP. Set (P/Q/R/S) on Top of Page.
- 3) Use of Non programmable scientific calculator is allowed.
- 4) Assume suitable data if necessary and mention clearly.
- 5) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

1)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- IS provision of concrete mix is given in _____.

 a) IS-10262-2009
 b) IS-383-1970

 b) IS-456-2000
 IS-4021-1061
- c) IS- 456-2000 d) IS-4031-1968

2) Air entraining agents _____

- a) Are used for entraining air in concrete
- b) Contain wood resins, fats and lignosalfonates
- c) Increase durability of concrete to frost action
- d) All of the above

3) Bleeding of concrete is said to occurs when _____

- a) Finer particles settle down at the bottom
- b) Coarser particles get separated
- c) Cement paste rises to the surface of concrete
- d) Finer particles collect in isolated pockets
- e) None of the above

4) Recommended slump value as per IS 456-2000 for high degree of workability of concrete is between _____ mm.

- a) 100-150 b) 25-75
- c) 50-100 d) less than 50
- 5) The compressive strength of 43 Grade OPC after three days is expected to be more than _____.
 - a) 16Mpa b) 23Mpa c) 27.5Mpa d) 33Mpa
- 6) The Standard size of concrete cube for compressive strength is _____.
 - a) 50 mm b) 150 mm
 - c) 70.07 mm d) 175 mm

Tensile strength of concrete can be expressed as _____

a) $500\sqrt{fck}$

c) $0.7\sqrt{fck}$

- b) $5000\sqrt{fck}$
- d) $7\sqrt{fck}$

Set R

Max. Marks: 70

Marks: 14

	SLR-FM-11
	Set R
8)	The workability of concrete by slump test is expressed asa) mm³/hb) mm²/hc) mm/hd) mm
9)	 The fineness modulus a) Is a numerical index of fineness b) Gives some idea of the mean size of particles present in the entire body of aggregate c) Is a sum of the cumulative percentages retained on the set of specified sieves divided by 100 d) All of the above
10)	The nominal mix corresponding to M20 grade concrete is a) 1:2:4 b) 1:3:6 c) 1:1.5:3 d) 1:1:2
11)	The compressive strength of concrete after 7 days of curing (Shall not be less than) times. a) $\frac{1}{2}$ b) $\frac{3}{2}$ c) $\frac{2}{3}$ d) $\frac{1}{3}$
12)	 The choice of mix proportion of a concrete is independent of a) grade designation b) maximum size of aggregate c) minimum water content ratio d) batching, mixing, placing and compaction techniques
13)	 The setting and hardening of cement after addition of water is due to a) The presence of gypsum b) Binding action of water c) Hydration of some of constituent compounds of cement d) Evaporation of water e) None of the above
14)	Permeability of concrete reduces with a) Decrease in water cement ratio b) Decrease in porosity

- c) Increase in strength of cementd) All of the above

16

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** CONCRETE TECHNOLOGY Day & Date: Saturday, 07-12-2019 Max. Marks: 56 Time: 10:00 AM To 01:00 PM **Instructions:** 1) All questions are compulsory. 3) Use of Non – programmable scientific calculator is allowed. 4) Assume suitable data if necessary and mention clearly. 5) Figures to the right indicate full marks. Section – I Q.2 Attempt any two questions from the following. What are IS specification for water to be used for making concrete? a) Explain effect of water cement ratio on strength of concrete. b) Explain various admixtures in concrete and their necessity. c) Attempt any four questions from the following. Q.3 Write a note on initial and final setting time of cement. a) Draw detailed flow chart of cement manufacturing by dry process. b) Explain compaction factor test for measuring workability. C) d) Write a note on segregation and bleeding. Explain high strength concrete. e) Section - II Q.2 Write a note on any Four of following. **Durability concrete** a) Light weight concrete b) High performance concrete C) Quality control of concrete d) Nominal Mix and Design Mix e) Q.3 Design a concrete mix of grade M25 as per ACI method. Using the following data: Concrete is to be used for Elevated water tank Exposure condition - Moderate. Standard deviation = 4 K Himsworth Constant = 1.65 Cement to be used - O.P.C. 43 grade Workability required - 50 mm Slump Method of concrete placing - Manual (Pumping is not required) Maximum size of aggregate - 20 mm (Crushed angular) Test data for material:-

- Specific gravity of materials are cement= 3.15, F.A. = 2.65 and C. A. = a) 2.80
- The dry rodded bulk densities of C. A. = 1600 Kg/ m^3 b)
- Water absorption of FA = 2% and CA = 1%. c)
- Fineness modulus of FA = 2.8. d)

Refer the Table no. 1 to 6 given below.

OR

Write a step by step procedure of designing concrete mix by IS method.

SLR-FM-11



12

16

12

16

Seat No.

SLR-FM-11 Set R

Table – 1

: Relation between water/cement ratio and average compressive strength of concrete, according to ACI 211.1-91

Average Compressive strength at 28 day	Effective water/cement ratio (by mas		
(MPa)	Non-air entrained concrete	Air entrained concrete	
45	0.38	0.52	
40	0.43		
35	0.48	0.40	
30	0.55	0.46	
25	0.62	0.53	
20	0.70	0.61	
15	0.80	0.71	

Table – 2

: Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions

Table 11.6. Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions					
Exposure Condition	Maximum W/C ratio, normal density aggregate concrete	Minimum design strength, low density aggregate concrete			
i. Concrete Intended to be Watertight	-	(MPa)			
(a) Exposed to fresh water	0.50	25			
(b) Exposed to brackish or sea water	0.45	30			
ii. Concrete exposed to freezing and thawing					
(a) Kerbs, Gutters, Guard rails or thin sections	0.45	30			
(b) Other elements	0.50	25			
(c) in presence of de-icing chemicals	0.45	30			
iii. For corrosion protection of reinforced concrete exposed to de- icing salts, brackish water, sea water or spray from these sources	0.40	33			

Table - 3

: Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91

Table 11.7. Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91					
Types of Construction	Range of Slump (mm)				
Reinforced foundation walls and footings	20-80				
Plain footings, Caissons and substructure walls	20-80				
Beams and reinforced walls	20-100				
Building columns	20-100				
Pavements and slabs	20-80				
Mass Concrete	20-80				

Table – 4

: Approximate requirement for mixing water and air content for different workability and nominal maximum size of Aggregate according to ACI 211.1-91

Workability or content	water con	er content, Kg/m ¹ of concrete for indicated maximum aggregate s (mm)			te size			
mm	10	12.5	20	25	40	50	70	150
Slump (mm)	-		Non-aii	entrained	concrete	6		
30-50	205	200	185	180	160	155	145	125
80-100	225	215	200	195	175	170	160	140
150-180	240	230	210	205	185	180	170	
	3	2.5	2	1.5	1	0.5	0.3	0.2
content %	Air entrained concrete							
		1 244 1		1		r		
30-50	180	1/5	165	160	145	140	135	120
80-100	200	190	180	175	160	155	150	135
150-180	215	205	190	185	170	165	160	(#)
Recommended avg. total air content % Mild Exposure	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00
Moderate Exposure	6.00	5.50	5.00	4.50	4.50	4.00	3.50	3.00
Extreme Exposure	7.50	7.00	6.00	6.00	5.50	5.00	4.50	4.00

Table – 5

Maximum Size of Aggregate	Bulk pe	volume of dry rod r unit volume of c modulus c	ded coarse aggre oncrete for finene of sand of	egate ess
EM.	2.40	2.60	2.80	3.00
10	0.50	0.48	0.46	0.44
12.5	0.59	0.57	0.55	0.53
20	0.66	0.64	0.62	0.60
25	0.71	0.69	0.67	0.65
40	0.75	0.73	0.71	0.69
50	0.78	0.76	0.74	0.72
70	0.82	0.80	0.78	0.76
150	0.87	0.85 ·	0.83	0.81

SLR-FM-11

Set R

SLR-FM-11 Set R

1 able - 0

: First Estimate of density (unit weight) of fresh concrete as given by ACI 211.1-91

Maximum	First Estimate of density ()	unit weight) of fresh concrete
size of Aggregate (nm)	Non air-entrained (kg/m3)	Air-entrained (kg/m3)
10	2285	2190
12.5	2315	2235
20	2355	2280
25	2375	2315
40	2420	2355
50	2445	2375
70	2465	2400
150	2505	2435

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory should be solved in first 30 minutes in answer book

- 2) Answer MCQ Objective type questions on page no. 3 only. Don't forget to mention, QP. Set (P/Q/R/S) on Top of Page.
- 3) Use of Non programmable scientific calculator is allowed.
- 4) Assume suitable data if necessary and mention clearly.
- 5) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 1) The Standard size of concrete cube for compressive strength is _____.
 - The Standard size of concrete cube for compressive strength is _____. a) 50 mm b) 150 mm
 - c) 70.07 mm d) 175 mm

2) Tensile strength of concrete can be expressed as _____.

- a) $500\sqrt{fck}$ c) $0.7\sqrt{fck}$ b) $5000\sqrt{fck}$ d) $7\sqrt{fck}$
- The workability of concrete by slump test is expressed as _____.
 - a) mm^3/h b) mm^2/h
 - c) mm/h d) mm
- 4) The fineness modulus _____
 - a) Is a numerical index of fineness
 - b) Gives some idea of the mean size of particles present in the entire body of aggregate
 - c) Is a sum of the cumulative percentages retained on the set of specified sieves divided by 100
 - d) All of the above

5) The nominal mix corresponding to M20 grade concrete is _____.

- a) 1:2:4 b) 1:3:6
- c) 1:1.5:3 d) 1:1:2
- 6) The compressive strength of concrete after 7 days of curing (Shall not be less than) _____ times.
 - a) $\frac{1}{2}$ b) $\frac{3}{2}$ c) $\frac{2}{3}$ d) $\frac{1}{3}$



Max. Marks: 70



- a) 100-150 b) 25-75
 - c) 50-100 d) less than 50
- 14) The compressive strength of 43 Grade OPC after three days is expected to be more than _____.
 - a) 16Mpa b) 23Mpa
 - c) 27.5Mpa d) 33Mpa

16

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** CONCRETE TECHNOLOGY Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM **Instructions:** 1) All questions are compulsory. 3) Use of Non – programmable scientific calculator is allowed. 4) Assume suitable data if necessary and mention clearly. 5) Figures to the right indicate full marks. Section – I Q.2 Attempt any two questions from the following. a) Explain effect of water cement ratio on strength of concrete. b) Explain various admixtures in concrete and their necessity. c) Attempt any four questions from the following. Q.3 Write a note on initial and final setting time of cement. a) b) Explain compaction factor test for measuring workability. C) d) Write a note on segregation and bleeding. Explain high strength concrete. e) Section - II Q.2 Write a note on any Four of following. **Durability concrete** a) Light weight concrete b) High performance concrete C) Quality control of concrete d) Nominal Mix and Design Mix e)

Fineness modulus of FA = 2.8. d)

Refer the Table no. 1 to 6 given below.

OR

Write a step by step procedure of designing concrete mix by IS method.

Max. Marks: 56

SLR-FM-11

12 What are IS specification for water to be used for making concrete? 16 Draw detailed flow chart of cement manufacturing by dry process. 12 Q.3 Design a concrete mix of grade M25 as per ACI method. 16 Using the following data: Concrete is to be used for Elevated water tank Exposure condition - Moderate. Standard deviation = 4 K Himsworth Constant = 1.65 Cement to be used - O.P.C. 43 grade Workability required - 50 mm Slump Method of concrete placing - Manual (Pumping is not required) Maximum size of aggregate - 20 mm (Crushed angular) Test data for material:-Specific gravity of materials are cement= 3.15, F.A. = 2.65 and C. A. = a) 2.80 The dry rodded bulk densities of C. A. = 1600 Kg/ m^3 b) Water absorption of FA = 2% and CA = 1%. c)

Seat No.



SLR-FM-11 Set S

Table – 1

: Relation between water/cement ratio and average compressive strength of concrete, according to ACI 211.1-91

Average Compressive strength at 28 day	Effective water/cement ratio (by mass)				
(MPa)	Non-air entrained concrete	Air entrained concrete			
45	0.38				
40	0.43				
35	0.48	0.40			
30	0.55	0.46			
25	0.62	0.53			
20	0.70	0.61			
15	0.80	0.71			

Table – 2

: Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions

Table 11.6. Requirements of ACI 318-89 for W/C ratio and Strength for Special Exposure conditions					
Exposure Condition	Maximum W/C ratio, normal density aggregate concrete	Minimum design strength, low density aggregate concrete			
i. Concrete Intended to be Watertight		(MPa)			
(a) Exposed to fresh water	0.50	25			
(b) Exposed to brackish or sea water	0.45	30			
ii. Concrete exposed to freezing and thawing					
(a) Kerbs, Gutters, Guard rails or thin sections	0.45	30			
(b) Other elements	0.50	25			
(c) in presence of de-icing chemicals	0.45	30			
iii. For corrosion protection of reinforced concrete exposed to de- icing salts, brackish water, sea water or spray from these sources	0.40	33			

Table - 3

: Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91

Table 11.7. Recommended Values of Slump for Various Type of Construction as given by ACI 211.1-91					
Types of Construction	Range of Slump (mm)				
Reinforced foundation walls and footings	20-80				
Plain footings, Caissons and substructure walls	20-80				
Beams and reinforced walls	20-100				
Building columns	20-100				
Pavements and slabs	20-80				
Mass Concrete	20-80				

Table – 4

: Approximate requirement for mixing water and air content for different workability and nominal maximum size of Aggregate according to ACI 211.1-91

Workability or content	water content, Kg/m' of concrete for indicated maximum aggr (mm)					aggrega	regate size	
mm	10	12.5	20	25	40	50	70	150
Slump (mm)	-		Non-aii	entrained	concrete	6		
30-50	205	200	185	180	160	155	145	125
80-100	225	215	200	195	175	170	160	140
150-180	240	230	210	205	185	180	170	
	3	2.5	2	1.5	1	0.5	0.3	0.2
content %	180	175	Air e	ntrained o	oncrete	140	135	120
30-50	180	175	165	160	145	140	135	120
80-100	200	190	180	175	160	155	150	135
150-180	215	205	190	185	170	165	160	(a))
Recommended avg. total air content % Mild Exposure	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00
Moderate Exposure	6.00	5.50	5.00	4.50	4.50	4.00	3.50	3.00
Extreme Exposure	7.50	7.00	6.00	6.00	5.50	5.00	4.50	4.00

Table – 5

Maximum Size of Aggregate	Bulk pe	volume of dry rod r unit volume of c modulus c	ded coarse aggre oncrete for finene of sand of	egate ess
F.M.	2.40	2.60	2.80	3.00
10	0.50	0.48	0.46	0.44
12.5	0.59	0.57	0.55	0.53
20	0.66	0.64	0.62	0.60
25	0.71	0.69	0.67	0.65
40	0.75	0.73	0.71	0.69
50	0.78	0.76	0.74	0.72
70	0.82	0.80	0.78	0.76
150	0.87	0.85 ·	0.83	0.81

SLR-FM-11

Set S

SLR-FM-11 Set S

Table -	- 6
---------	-----

: First Estimate of density (unit weight) of fresh concrete as given by ACI 211.1-91

Maximum size of Aggregate (mm)	First Estimate of density (unit weight) of fresh concrete	
	Non air-entrained (kg/m3)	Air-entrained (kg/m3)
10	2285	2190
12.5	2315	2235
20	2355	2280
25	2375	2315
40	2420	2355
50	2445	2375
70	2465	2400
150	2505	2435

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - I**

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 i	s compulsory and should be solved in first 30 minutes in answer
book.	

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - 1) The bending equation is ____
 - a) M/I = F/Y = E/Rb) I/M = F/Y = E/Rc) M/I = R/E = F/Yd) M/I = Y/E = E/R
 - 2) The strength of beams mainly depends on
 - a) bending moment b) c.g. of the section
 - c) section modulus d) its weight
 - The Eccentric Vertical Load generates _____. 3)
 - a) Only Direct Stress
 - b) Only Bending Stress
 - c) Combined Bending and Direct Stress
 - d) Shear Stress
 - 4) For no tension in the section, the eccentricity must not exceed .
 - a) k^2/d $2k^2/d$ b)
 - c) 4k2/d d)
 - d= depth of section, k= radius of gyration
 - 5) When thin cylindrical shell is subjected to internal fluid pressure, which of the following stress is developed in its wall?
 - a) Circumferential stress
 - c) Both a & b d) None of the above
 - The angle of twist is _____ proportional to twisting moment. 6)
 - a) directly c) both a & b
 - b) inversely d) none of the above
 - The strain energy stored by the body with in elastic limit when loaded 7) externally is called as _____
 - a) resilience proof resilience b)
 - c) modulus of resilience d) none of the above
 - 8) In the case of an I-section beam maximum shear stress is at _____.
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b
 - d) none of the above





b) Longitudinal stress

Marks: 14

Max. Marks: 70

SLR-FM-12



a) linear

c) either of a and b

- b) parabolic
- d) cubic

SLR-FM-12

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.



Q.3 Draw Shear Force and Bending Moment diagram for the Beam shown in Figure **09** 2 below. Show all the Calculations.





Set P

Set P um 09

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250
 O9 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.



10



- Q.8 A solid circular shaft transmits 75 KW power at 200 r.p.m. Calculate the shaft diameter, if the twist in the shaft is not to exceed 1^o in 2 meters length of the shaft & shear stress is limited to 50 N/mm², Take C=100 x 10³N/mm²
- Q.9 Find the moment of resistance of a flitched beam with a Timber part of 200mm vide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

Max. Marks: 70

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - I**

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In the case of an I-section beam maximum shear stress is at _____. 1)
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b
 - d) none of the above
- 2) In flitched beam at same level strains in wood and steel should be kept _____.
 - a) equal c) both a and b

- b) unequal d) can't say anything
- The Internal resistance which the body offers to meet the external force 3) or load is called as _____.
 - a) stress b) strain
 - c) pressure d) none of the above
- 4) The ratio of lateral strain to linear strain is known as _
 - a) modulus of elasticity b) modulus of rigidity elastic limit
 - d) c) poisson's ratio
- The relation between E (modulus of elasticity) & C (modulus of rigidity) is 5) given
 - a) E = C(1 + 1/m)c) E = C(1 + 2/m)
- E = 2C (1 + 1/m)b) d) None of these

The point of contra flexure is also called _____ 6)

- a) the point of inflexion c) both a and b
 - b) a virtual hinge d) none of the above
- In a cantilever beam with uniformly distributed load shear force varies 7) along the span with following relation _
 - a) linear b) parabolic
 - c) either of a and b d) cubic
- 8) The bending equation is _____ a) M/I = F/Y = E/Rb) I/M = F/Y = E/RM/I = Y/E = E/Rc) M/I = R/E = F/Yd)
- 9) The strength of beams mainly depends on _____ a) bending moment b) c.g. of the section
 - c) section modulus d) its weight



Marks: 14

- 10) The Eccentric Vertical Load generates _____.
 - a) Only Direct Stress
 - b) Only Bending Stress
 - c) Combined Bending and Direct Stress
 - d) Shear Stress
- 11) For no tension in the section, the eccentricity must not exceed _____.
 - a) k^2/d b) $2k^2/d$
 - d) k^2/d^2
 - d= depth of section, k= radius of gyration
- 12) When thin cylindrical shell is subjected to internal fluid pressure, which of the following stress is developed in its wall?

b)

- a) Circumferential stress
- b) Longitudinal stress

inversely

- c) Both a & b
- d) None of the above
- 13) The angle of twist is _____ proportional to twisting moment.
 - a) directly

c) 4k2/d

- c) both a & b d) none of the above
- 14) The strain energy stored by the body with in elastic limit when loaded externally is called as _____.
 - a) resilience
 - c) modulus of resilience
- b) proof resilience
- d) none of the above

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.



Q.3 Draw Shear Force and Bending Moment diagram for the Beam shown in Figure 09 2 below. Show all the Calculations.



Max. Marks: 56

Set Q

09

SLR-FM-12

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional

50mm

+----- 300mm ----

details of beam given in Figure 3 below.

300mm 40mm Figure 3

Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250
 O9 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.



10

Set Q

- Q.8 A solid circular shaft transmits 75 KW power at 200 r.p.m. Calculate the shaft diameter, if the twist in the shaft is not to exceed 1⁰ in 2 meters length of the shaft & shear stress is limited to 50 N/mm², Take C=100 x 10³N/mm²
- Q.9 Find the moment of resistance of a flitched beam with a Timber part of 200mm wide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - I**

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- When thin cylindrical shell is subjected to internal fluid pressure, which of 1) the following stress is developed in its wall?
 - a) Circumferential stress c) Both a & b
- b) Longitudinal stress d) None of the above
- 2) The angle of twist is _____ proportional to twisting moment.
 - a) directly inversely b) c) both a & b
 - d) none of the above
- The strain energy stored by the body with in elastic limit when loaded 3) externally is called as _____.
 - a) resilience proof resilience b)
 - c) modulus of resilience d) none of the above
- 4) In the case of an I-section beam maximum shear stress is at
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b
 - d) none of the above
- In flitched beam at same level strains in wood and steel should be kept . 5) b) unequal
 - a) equal
 - c) both a and b d) can't say anything
- The Internal resistance which the body offers to meet the external force 6) or load is called as .
 - a) stress c) pressure

- b) strain
- d) none of the above
- 7) The ratio of lateral strain to linear strain is known as _____
 - a) modulus of elasticity modulus of rigidity b) c) poisson's ratio d) elastic limit
- The relation between E (modulus of elasticity) & C (modulus of rigidity) is 8) given _____.
 - a) E = C(1 + 1/m)
 - c) E = C(1 + 2/m)
- b) E = 2C (1 + 1/m)
- d) None of these



Max. Marks: 70
			SLR-FM-	·12
			Set	R
9)	The point of contra flexure is also c a) the point of inflexion c) both a and b	alled b) d)	a virtual hinge none of the above	
10)	In a cantilever beam with uniformly along the span with following relation a) linear c) either of a and b	distri on b) d)	buted load shear force varies parabolic cubic	
11)	The bending equation is a) $M/I = F/Y = E/R$ c) $M/I = R/E = F/Y$	b) d)	I/M = F/Y = E/R M/I = Y/E = E/R	
12)	The strength of beams mainly depe a) bending moment c) section modulus	ends d b) d)	on c.g. of the section its weight	
13)	 The Eccentric Vertical Load general a) Only Direct Stress b) Only Bending Stress c) Combined Bending and Direct d) Shear Stress 	ates _ Stres	 S	
14)	For no tension in the section, the e a) k^2/d c) $4k2/d$	ccent b) d)	ricity must not exceed 2k²/d k²/d²	

d= depth of section, k= radius of gyration

Set

R

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.

Q



Q.3 Draw Shear Force and Bending Moment diagram for the Beam shown in Figure 09 2 below. Show all the Calculations.





Set R um 09

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250 09 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.



SLR-FM-12 Set R

- Q.8 A solid circular shaft transmits 75 KW power at 200 r.p.m. Calculate the shaft diameter, if the twist in the shaft is not to exceed 1^o in 2 meters length of the shaft & shear stress is limited to 50 N/mm², Take C=100 x 10³N/mm²
- Q.9 Find the moment of resistance of a flitched beam with a Timber part of 200mm vide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - I**

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsor	ry and should be solved in first 30 minut	es in answer
book.		

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

b)

strain

Duration: 30 Minutes

Seat

No.

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The Internal resistance which the body offers to meet the external force 1) or load is called as _____.
 - a) stress
 - c) pressure d) none of the above

2) The ratio of lateral strain to linear strain is known as

- a) modulus of elasticity modulus of rigidity b) d) elastic limit
- c) poisson's ratio
- The relation between E (modulus of elasticity) & C (modulus of rigidity) is 3) given _____.
 - a) E = C(1 + 1/m)c) E = C(1 + 2/m)
- b) E = 2C (1 + 1/m)None of these d)
- 4) The point of contra flexure is also called
 - a) the point of inflexion
- a virtual hinge b) d) none of the above
- c) both a and b
- In a cantilever beam with uniformly distributed load shear force varies 5) along the span with following relation _____
 - a) linear b) parabolic
- c) either of a and b cubic d) 6)
 - The bending equation is _____. a) M/I = F/Y = E/Rb) I/M = F/Y = E/R
 - c) M/I = R/E = F/YM/I = Y/E = E/Rd)
- 7) The strength of beams mainly depends on _____
 - a) bending moment b) c.g. of the section
 - c) section modulus d) its weight
- The Eccentric Vertical Load generates _____. 8)
 - a) Only Direct Stress
 - b) Only Bending Stress
 - c) Combined Bending and Direct Stress
 - d) Shear Stress

Set

Max. Marks: 70

When thin cylindrical shell is subjected to internal fluid pressure, which of	
the following stress is developed in its well?	

Set S

the following stress is developed in its wall? a) Circumferential stress b) Longitudinal stress

For no tension in the section, the eccentricity must not exceed _____.

b) $2k^{2}/d$

d)

 k^2/d^2

c) Both a & b d) None of the above

d= depth of section, k= radius of gyration

- The angle of twist is _____ proportional to twisting moment. 11)
 - a) directly

a) k^2/d

c) 4k2/d

9)

10)

- b) inversely
- c) both a & b d) none of the above
- 12) The strain energy stored by the body with in elastic limit when loaded externally is called as
 - a) resilience proof resilience b)
 - c) modulus of resilience d) none of the above
- 13) In the case of an I-section beam maximum shear stress is at _____.
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b
 - d) none of the above
- In flitched beam at same level strains in wood and steel should be kept _____. 14)
 - a) equal
 - c) both a and b

- b) unequal
- d) can't say anything

Page 18 of 20

SLR-FM-12

Set

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.

Q



Q.3 Draw Shear Force and Bending Moment diagram for the Beam shown in Figure 09 2 below. Show all the Calculations.



Max. Marks: 56

Set <u>S</u>

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250 09 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.





- Q.8 A solid circular shaft transmits 75 KW power at 200 r.p.m. Calculate the shaft diameter, if the twist in the shaft is not to exceed 1^o in 2 meters length of the shaft & shear stress is limited to 50 N/mm², Take C=100 x 10³N/mm²
- Q.9 Find the moment of resistance of a flitched beam with a Timber part of 200mm vide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

Set

Seat No.

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to right indicates in full marks.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book.

Vertical plate

None of these

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Line of collimation need not be truly perpendicular to vertical axis in .
 - tilting level a) dumpy level b)
 - c) auto level d) all the above
- 2) Vernier is a device for measuring fractional part of the smallest division on _
 - a) Horizontal plate b) d)
 - Both a and b C)
- 3) Which one of the following statement is correct?
 - a) The axis of plate level should be parallel to the vertical axis
 - b) The axis of telescope must be parallel to the horizontal axis
 - c) The line of collimation must be perpendicular to horizontal axis
 - d) The line of collimation must be perpendicular to the plate level axis
- 4) Third rule is applied to
 - an open traverse for graphical adjustment a)
 - determine the effect of local attraction b)
 - c) a closed traverse for adjustment of closing error
 - d) none of the error

a)

5) Proportional compass is used for measurement of _

- a) Included angle Magnetic Bearing b) c) Redrawing with other scale
 - d) none of these
- Telescopic alidade can measure 6)
 - Vertical angle Horizontal angle b) a)
 - All of these Magnetic bearing d) C)
- Abney level is used for measurement of _ 7)
 - Horizontal angle Vertical angle of slope b)
 - Difference in level Horizontal distance C) d)
- 8) Most accurate estimate of volume, is given by _
 - End Area formula Mean Area formula a) b)
 - Prismoidal formula Trapezoidal rule c) d)

Max. Marks: 70

Marks: 14

- 9) Total station can be used for _ _____.
 - a) Missing line measurement
 - Remote elevation measurement b)
 - c) Stake out
 - d) All of these
- Determination of Plotted position of station occupied by plane table is 10) called _
 - Traversing a) c) Intersection
- b) Resection Radiation d)
- The method of orientation a plane table with two already plotted points is 11) known as ___.
 - a) Intersection c) Back sighting

- Traversing
- d) two-point problem

b)

- Irregular area of a closed figure may be computed by an instrument 12) known as ___
 - a) Pantograph
 - c) Passometer
- b) Planimeter
- d) None of above
- Area of zero circle comes into account in _ 13)
 - a) Anchor pt. outside case
 - c) Both of these
- Anchor pt. inside case b) d) None of these
- 14) Curvature correction to a staff reading in a differential leveling survey is _
 - a) always subtractive
- b) always zero
- c) always additive
- depend on latitude d)

SLR-FM-13 Set

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two questions from each section

Section – I

Staff

station

Α

2.356

Staff

station

В

1.733

In two peg test of dumpy level, the following observations were made. Q.2 A)

Instrument Station

Mid-way

Station O 3.235 3.152 The distance between A and B is 80 m. the station O is situated on line BA produced at a distance of 16 m from station A. Is the line of collimation is adjusted? if not, state whether the line of collimation is inclined upwards or downwards also calculate the collimation error and find out correct readings on A and B to give a horizontal line of sight, when the instrument is at station O.

- When Reciprocal levelling done? Describe the method along with sketch. B) 04
- Q.3 A) The table below gives the lengths and bearings of the lines of a traverse 05 ABCDE. Determine the length and bearing of the fifth line.

Line	Length (m)	Reduced Bearing
AB	194.1	N 85°30' E
BC	201.2	N 15°00' E
CD	165.4	N 74°30' W
DE	172.6	S 15°30' W
EA	?	?

How can the height of tower be determined when it is not accessible in 04 B) trigonometric leveling?

Max. Marks: 56

06

Seat No.

Set P

06

Q.4	A)	A closed traverse was conducted round an obstacle and the following
		observations were made. Work out the missing quantities:

Line	Length (m)	WCB
AB	298.7	0°0'
BC	205.7	334°48'
CD	L1	255°6'
DE	L2	123°36'
EA	231.4	35°36'

	B)	Describe how you would measure vertical angle using theodolite?	03
Q.5	A)	What is Nautical Sextant? Explain in detail working of it.	06
	B)	Write short note	03

Write short note B)

- Hand Level i)
- ii) Abney level

Section – II

Q.6	A) B)	Explain in detail Electromagnetic Spectrum.0Explain the construction and working of Geodimeter.0						04 06				
Q.7	A)	Define: i) Principle o ii) Orientation	f plai າ	ne tabl	e surve	eying						03
	B)	What are the m	netho	ds of p	olane ta	abling?	Desc	ribe of t	hem wit	h neat s	sketch.	06
Q.8	A) B)	Describe methe Explain charac	ods c terist	of interp ics of c	oolatior	n of cou [.] lines v	ntours vith ne	eat sket	ch.			04 05
Q.9	A)	The following c	offset	s were	taken	from a	chain	line to a	a hedge	•		05
		Distance (m) Offset (m)	0 9.4	20 10.8	40 13.6	60 11.2	80 9.6	120 8.4	160 7.5	220 6.3	280 4.6	
		Determine the by Simpsons ru	area ule.	includ	ed betv	veen th	ie cha	in line a	ind hed	ge and o	offsets	

B) Explain working of planimeter (Mechanical) and state its various parts. 04

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to right indicates in full marks.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book.

MCQ/Objective Type Questions

Duration: 30 Minutes

8)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Most accurate estimate of volume, is given by b)
 - a) Mean Area formula
 - c) Prismoidal formula d)
- 2) Total station can be used for
 - Missing line measurement a)
 - b) Remote elevation measurement
 - c) Stake out
 - d) All of these
- Determination of Plotted position of station occupied by plane table is 3) called
 - a) Traversing b) Resection
 - c) Intersection d) Radiation
- The method of orientation a plane table with two already plotted points is 4) known as
 - a) Intersection b) Traversing
 - two-point problem c) Back sighting d)
- 5) Irregular area of a closed figure may be computed by an instrument known as _____ Planimeter
 - a) Pantograph b)
 - c) Passometer d) None of above

Area of zero circle comes into account in _ 6)

- a) Anchor pt. outside case b) Anchor pt. inside case
 - None of these c) Both of these d)
- Curvature correction to a staff reading in a differential leveling survey 7) is .
 - a) always subtractive b) d)
 - c) always additive
 - Line of collimation need not be truly perpendicular to vertical axis in _____. a) dumpy level
 - tilting level b)

always zero

depend on latitude

c) auto level all the above d)

Max. Marks: 70

End Area formula

Trapezoidal rule

Seat

No.

Set Q

Marks: 14

- 9) Vernier is a device for measuring fractional part of the smallest division on .
 - a) Horizontal plate
- b) Vertical plate
- c) Both a and b d) None of these
- 10) Which one of the following statement is correct?
 - The axis of plate level should be parallel to the vertical axis a)
 - The axis of telescope must be parallel to the horizontal axis b)
 - c) The line of collimation must be perpendicular to horizontal axis
 - d) The line of collimation must be perpendicular to the plate level axis
- Third rule is applied to 11)
 - a) an open traverse for graphical adjustment
 - determine the effect of local attraction b)
 - c) a closed traverse for adjustment of closing error
 - d) none of the error

12) Proportional compass is used for measurement of _____ **Magnetic Bearing**

- a) Included angle
- b) c) Redrawing with other scale d)
 - none of these
- 13) Telescopic alidade can measure
 - a) Horizontal angle Vertical angle b) All of these
 - c) Magnetic bearing d)
- Abney level is used for measurement of 14)
 - b) Vertical angle of slope
 - Difference in level c)

a) Horizontal angle

Horizontal distance d)

SLR-FM-13

Set

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two questions from each section

Section – I

Staff

station

Α

2.356

Staff

station

В

1.733

In two peg test of dumpy level, the following observations were made. Q.2 A)

Instrument Station

Mid-way

Station O 3.235 3.152 The distance between A and B is 80 m. the station O is situated on line BA produced at a distance of 16 m from station A. Is the line of collimation is adjusted? if not, state whether the line of collimation is inclined upwards or downwards also calculate the collimation error and find out correct readings on A and B to give a horizontal line of sight, when the instrument is at station O.

- When Reciprocal levelling done? Describe the method along with sketch. B) 04
- Q.3 A) The table below gives the lengths and bearings of the lines of a traverse 05 ABCDE. Determine the length and bearing of the fifth line.

Line	Length (m)	Reduced Bearing
AB	194.1	N 85°30' E
BC	201.2	N 15º00' E
CD	165.4	N 74°30' W
DE	172.6	S 15°30' W
EA	?	?

How can the height of tower be determined when it is not accessible in 04 B) trigonometric leveling?

Max. Marks: 56

06

Set

Seat No.

Set Q

06

Q.4	A)	A closed traverse was conducted round an obstacle and the following
		observations were made. Work out the missing quantities:

Line	Length (m)	WCB
AB	298.7	0°0'
BC	205.7	334°48'
CD	L1	255°6'
DE	L2	123°36'
EA	231.4	35°36'

	B)	Describe how you would measure vertical angle using theodolite?	03
Q.5	A)	What is Nautical Sextant? Explain in detail working of it.	06
	B)	Write short note	03

D)

- Hand Level i)
- ii) Abney level

Section – II

Q.6	A) B)	Explain in deta Explain the cor	il Ele nstruc	ctroma	agnetic nd wor	Spectiking of	[.] um. Geod	imeter.				04 06
Q.7	A)	Define: i) Principle c ii) Orientation	efine: Principle of plane table surveying Orientation									03
	B)	B) What are the methods of plane tabling? Describe of them with neat sketch.								06		
Q.8	A) B)	Describe methods of interpolation of contours. Explain characteristics of contour lines with neat sketch.							04 05			
Q.9	A)	The following o	offset	s were	taken	from a	chain	line to a	a hedge	;		05
		Distance (m) Offset (m)	0 9.4	20 10.8	40 13.6	60 11.2	80 9.6	120 8.4	160 7.5	220 6.3	280 4.6	
	_`	Determine the by Simpsons re	area ule.	includ	ed betv	veen th	ne cha	in line a	and hed	ge and o	offsets	

B) Explain working of planimeter (Mechanical) and state its various parts. 04

Seat	
No.	

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to right indicates in full marks.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book.

MCQ/Objective Type Questions

Duration: 30 Minutes

Choose the correct alternatives from the options and rewrite the sentence. Q.1 14

- 1) Proportional compass is used for measurement of
 - a) Included angle Magnetic Bearing b) Redrawing with other scale none of these d) c)
- 2) Telescopic alidade can measure _
 - a) Horizontal angle b) Vertical angle
 - c) Magnetic bearing d) All of these

Abney level is used for measurement of 3)

- a) Horizontal angle Vertical angle of slope b)
 - c) Difference in level Horizontal distance d)

4) Most accurate estimate of volume, is given by _____

- a) Mean Area formula End Area formula b)
- c) Prismoidal formula d) Trapezoidal rule
- 5) Total station can be used for _
 - a) Missing line measurement
 - b) Remote elevation measurement
 - C) Stake out
 - d) All of these
- 6) Determination of Plotted position of station occupied by plane table is called
 - Traversing a) Resection b)
 - c) Intersection d) Radiation
- 7) The method of orientation a plane table with two already plotted points is known as

d)

- a) Intersection b) Traversing
- two-point problem c) Back sighting d)
- Irregular area of a closed figure may be computed by an instrument 8) known as _____
 - a) Pantograph b) Planimeter
 - c) Passometer d) None of above
- 9) Area of zero circle comes into account in _ a) Anchor pt. outside case
 - Anchor pt. inside case b)

None of these

c) Both of these

Set R

Max. Marks: 70

Marks: 14

10) Curvature correction to a staff reading in a differential leveling survey is .

- a) always subtractive
- b) always zero
- c) always additive d)
- depend on latitude

SLR-FM-13

Set R

- 11) Line of collimation need not be truly perpendicular to vertical axis in .
 - a) dumpy level b) tilting level auto level C)
 - d) all the above
- Vernier is a device for measuring fractional part of the smallest division 12) on
 - a) Horizontal plate
- Vertical plate b)
- c) Both a and b d) None of these
- 13) Which one of the following statement is correct?
 - a) The axis of plate level should be parallel to the vertical axis
 - The axis of telescope must be parallel to the horizontal axis b)
 - The line of collimation must be perpendicular to horizontal axis C)
 - d) The line of collimation must be perpendicular to the plate level axis
- 14) Third rule is applied to _
 - a) an open traverse for graphical adjustment
 - b) determine the effect of local attraction
 - c) a closed traverse for adjustment of closing error
 - d) none of the error

06

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering SURVEYING – I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two questions from each section

Section – I

Q.2 A) In two peg test of dumpy level, the following observations were made.

Station O

The distance between A and B is 80 m. the station O is situated on line BA produced at a distance of 16 m from station A. Is the line of collimation is adjusted? if not, state whether the line of collimation is inclined upwards or downwards also calculate the collimation error and find out correct readings on A and B to give a horizontal line of sight, when the instrument is at station O.

- B) When Reciprocal levelling done? Describe the method along with sketch. 04
- **Q.3** A) The table below gives the lengths and bearings of the lines of a traverse **05** ABCDE. Determine the length and bearing of the fifth line.

Line	Length (m)	Reduced Bearing
AB	194.1	N 85°30' E
BC	201.2	N 15º00' E
CD	165.4	N 74°30' W
DE	172.6	S 15°30' W
EA	?	?

B) How can the height of tower be determined when it is not accessible in trigonometric leveling?

StaffStaffInstrument StationstationABMid-way2.3561.733

3.235

3.152

Max. Marks: 56

Seat No.

Set R 06

SLR-FM-13

Q.4 A) A closed traverse was conducted round an obstacle and the following observations were made. Work out the missing quantities:

Line	Length (m)	WCB
AB	298.7	0°0'
BC	205.7	334°48'
CD	L1	255°6'
DE	L2	123°36'
EA	231.4	35°36'

- 03 B) Describe how you would measure vertical angle using theodolite? Q.5 A) What is Nautical Sextant? Explain in detail working of it. 06 Write short note 03 B)
 - - Hand Level i) ii)
 - Abney level

Section – II

Q.6	A) B)	Explain in deta Explain the cor	il Ele nstruc	ctroma	agnetic nd worl	Spectr king of	um. Geod	imeter.				04 06
Q.7	A)	Define: i) Principle o ii) Orientation	efine: 0 Principle of plane table surveying Orientation									03
	B)	B) What are the methods of plane tabling? Describe of them with neat sketch.								06		
Q.8	A) B)	Describe methods of interpolation of contours. Explain characteristics of contour lines with neat sketch.							04 05			
Q.9	A)	The following c	offset	s were	taken	from a	chain	line to a	a hedge	•		05
		Distance (m) Offset (m)	0 9.4	20 10.8	40 13.6	60 11.2	80 9.6	120 8.4	160 7.5	220 6.3	280 4.6	
	_`	Determine the by Simpsons ru	area ıle.	include	ed betv	veen th	ne cha	in line a	and hed	ge and o	offsets	

B) Explain working of planimeter (Mechanical) and state its various parts. 04

Set

Max. Marks: 70

Marks: 14

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to right indicates in full marks.

2) Assume suitable data if necessary but mention it clearly.

3) Q. No. 1 is compulsory and should be solved in first 30 minutes in Answer Book.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Choose the correct alternatives from the options and rewrite the sentence. Q.1 14

b)

Resection

Traversing

- Determination of Plotted position of station occupied by plane table is 1) called
 - Traversing a)
 - d) Radiation Intersection C)
- 2) The method of orientation a plane table with two already plotted points is known as
 - a) Intersection b)
 - c) Back sighting d) two-point problem
- Irregular area of a closed figure may be computed by an instrument 3) known as
 - a) Pantograph b) Planimeter
 - c) Passometer None of above d)
- 4) Area of zero circle comes into account in
 - Anchor pt. inside case a) Anchor pt. outside case b)
 - c) Both of these d) None of these
- Curvature correction to a staff reading in a differential leveling survey 5) is .
 - a) always subtractive b) always zero
 - depend on latitude c) always additive d)

Line of collimation need not be truly perpendicular to vertical axis in _____. 6)

- a) dumpy level tilting level b) c) auto level d) all the above
- 7) Vernier is a device for measuring fractional part of the smallest division
 - on __ a) Horizontal plate b) Vertical plate
 - Both a and b None of these d) C)
- 8) Which one of the following statement is correct?
 - a) The axis of plate level should be parallel to the vertical axis
 - b) The axis of telescope must be parallel to the horizontal axis
 - c) The line of collimation must be perpendicular to horizontal axis
 - d) The line of collimation must be perpendicular to the plate level axis

9) Third rule is applied to _____ a) an open traverse for graphical adjustment b) determine the effect of local attraction c) a closed traverse for adjustment of closing error d) none of the error Proportional compass is used for measurement of _____ 10) a) Included angle **Magnetic Bearing** b) c) Redrawing with other scale none of these d) Telescopic alidade can measure ____ 11) a) Horizontal angle Vertical angle b) All of these c) Magnetic bearing d) 12) Abney level is used for measurement of _ a) Horizontal angle Vertical angle of slope b) c) Difference in level Horizontal distance d) 13) Most accurate estimate of volume, is given by _ End Area formula Mean Area formula b) a) c) Prismoidal formula d) Trapezoidal rule 14) Total station can be used for _____. Missing line measurement a)

- b) Remote elevation measurement
- c) Stake out
- d) All of these

SLR-FM-13

Set S



Seat No.

S.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two questions from each section

Section – I

Q.2 A) In two peg test of dumpy level, the following observations were made.

06

	Staff	Staff
Instrument Station	station	station
	Α	В
Mid-way	2.356	1.733
Station O	3.235	3.152

The distance between A and B is 80 m, the station O is situated on line BA produced at a distance of 16 m from station A. Is the line of collimation is adjusted? if not, state whether the line of collimation is inclined upwards or downwards also calculate the collimation error and find out correct readings on A and B to give a horizontal line of sight, when the instrument is at station O.

- When Reciprocal levelling done? Describe the method along with sketch. B) 04
- Q.3 A) The table below gives the lengths and bearings of the lines of a traverse 05 ABCDE. Determine the length and bearing of the fifth line.

Line	Length (m)	Reduced Bearing
AB	194.1	N 85°30' E
BC	201.2	N 15º00' E
CD	165.4	N 74°30' W
DE	172.6	S 15°30' W
EA	?	?

How can the height of tower be determined when it is not accessible in 04 B) trigonometric leveling?

Max. Marks: 56

Set S

06

Q.4	A)	A closed traverse was conducted round an obstacle and the following
		observations were made. Work out the missing quantities:

Line	Length (m)	WCB
AB	298.7	0°0'
BC	205.7	334°48'
CD	L1	255°6'
DE	L2	123°36'
EA	231.4	35°36'

	B)	Describe how you would measure vertical angle using theodolite?	03
Q.5	A)	What is Nautical Sextant? Explain in detail working of it.	06
	B)	Write short note	03

- D)
 - Hand Level i) ii) Abney level

Section – II

Q.6	A) B)	Explain in deta Explain the cor	il Ele nstruc	ctroma	agnetic nd worl	Spectr king of	um. Geod	imeter.				04 06
Q.7	A)	Define: i) Principle of plane table surveying ii) Orientation						03				
	B)	What are the methods of plane tabling? Describe of them with neat sketch. 0								06		
Q.8	A) B)	Describe methods of interpolation of contours.0Explain characteristics of contour lines with neat sketch.0					04 05					
Q.9	A)	The following offsets were taken from a chain line to a hedge							05			
		Distance (m) Offset (m)	0 9.4	20 10.8	40 13.6	60 11.2	80 9.6	120 8.4	160 7.5	220 6.3	280 4.6	
	_`	Determine the area included between the chain line and hedge and by Simpsons rule.							offsets			

B) Explain working of planimeter (Mechanical) and state its various parts. 04

Set P

Max. Marks: 70

Marks: 14

7

7

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to the right indicate full marks.
 - 3) Assume correct data wherever necessary.

MCQ/Objective Type Questions Duration: 30 Minutes Q.1 State whether following statements are correct or incorrect.

- 1) Extrados is inner curve of an arch.
- 2) Casing and capping is type of closed wiring.
- 3) Spouts are provided for transportation of bathroom waste water.
- 4) Normally for plastering mortar of CM 1:4 is used.
- 5) Plumbing systems involves installation of Telephone cables.
- 6) In case of load bearing structures, less carpet area is available.
- 7) The switch boards are fixed at sill height in residential buildings.

State whether the following statement is true or false.

- 8) Combined footing is used for single column.
- 9) If a modular brick is cut along width in half size then it is called as Queen Closer
- 10) Through stone is a stone stretcher.
- 11) Flemish bond has greater strength as compared to English bond.
- 12) Mullion divides door and window vertically.
- 13) Landing is a biggest tread or going of half turn staircase.
- 14) Voussoirs of an arch remains in tension.

Set | P

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use half imperial sheet for section II and answer book for section I.
- 4) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. (any Seven)

- a) What is through stone? Explain its importance in masonry work.
- b) Compare Load bearing structure with framed structure.
- c) Draw neat sketches for any two of door hinges.
- d) Explain system of Air Conditioning in winter?
- e) Write a note on various defects in plastering?
- f) Write a note on: Thermal Insulation of Building.
- g) Draw a neat sketch of Gully Trap and Intercepting Trap.
- h) Define following terms:
 - 1) Queen Closer
 - 2) King Closer
 - 3) Closer
 - 4) Beveled closer
- i) Enlist various types of roofs? Discuss any two types of roof with their suitability.
- j) What is concept of earthing? Also explain procedure of earthing in brief?

Section - II

Q.3 Draw to scale 1:10 Elevation and Plan for alternate courses of STRETCHER Bond and HEADER Bond for L shaped wall.

OR

Draw to scale 1:20 Plan and Sectional Elevation for a RCC Rectangular Combined Footing of size (1200mm X 2400mm) with two columns of size (350mm X 350mm) symmetrically placed on both sides. Centre to Centre distance between two columns is 1500mm Depth of Footing = 600 mm 150mm Projection on all sides of footing for PCC Depth of PCC bed = 150mm

Depth of excavation pit below Ground Level = 1200mm

Q.4 Draw to scale 1:10 Front Elevation, Sectional Elevation and Sectional Plan 14 of a framed Teakwood Single Leaf Fully Glazed Window. Use following data:

Clear opening = 800mm X 1200mm

Wooden section for frame = 100mm X 60mm

Wooden section for style and rail = 100mm X 35mm

Glass Panel = 8mm thick (2 numbers per shutter)

Sash bar = 20mm thick

Show various fixtures at proper locations

Max. Marks: 56

28

Set P

Draw to scale 1: 20 Plan and Sectional Elevation of a Quarter Turn RCC Staircase. Use following data: Height to be climbed = 3150mm Winders are not allowed Width of stair flights = 1000mm Riser = 150mm to 180mm Tread = 230mm to 300mm Railing = 80mm Stainless Steel Pipe Railing Waist slab = 150mm thick Reinforcement details not expected Write step by step calculation on sheet with pencil only.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering

BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to the right indicate full marks.
 - 3) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 State whether following statements are correct or incorrect.

- 1) Normally for plastering mortar of CM 1:4 is used.
- 2) Plumbing systems involves installation of Telephone cables.
- 3) In case of load bearing structures, less carpet area is available.
- 4) The switch boards are fixed at sill height in residential buildings.
- 5) Extrados is inner curve of an arch.
- 6) Casing and capping is type of closed wiring.
- 7) Spouts are provided for transportation of bathroom waste water.

State whether the following statement is true or false.

- 8) Flemish bond has greater strength as compared to English bond.
- 9) Mullion divides door and window vertically.
- 10) Landing is a biggest tread or going of half turn staircase.
- 11) Voussoirs of an arch remains in tension.
- 12) Combined footing is used for single column.
- 13) If a modular brick is cut along width in half size then it is called as Queen Closer
- 14) Through stone is a stone stretcher.



Max. Marks: 70

Marks: 14

7



Set | Q

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use half imperial sheet for section II and answer book for section I.
- 4) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. (any Seven)

- a) What is through stone? Explain its importance in masonry work.
- b) Compare Load bearing structure with framed structure.
- c) Draw neat sketches for any two of door hinges.
- d) Explain system of Air Conditioning in winter?
- e) Write a note on various defects in plastering?
- f) Write a note on: Thermal Insulation of Building.
- g) Draw a neat sketch of Gully Trap and Intercepting Trap.
- h) Define following terms:
 - 1) Queen Closer
 - 2) King Closer
 - 3) Closer
 - 4) Beveled closer
- i) Enlist various types of roofs? Discuss any two types of roof with their suitability.
- j) What is concept of earthing? Also explain procedure of earthing in brief?

Section - II

Q.3 Draw to scale 1:10 Elevation and Plan for alternate courses of STRETCHER Bond and HEADER Bond for L shaped wall.

OR

Draw to scale 1:20 Plan and Sectional Elevation for a RCC Rectangular Combined Footing of size (1200mm X 2400mm) with two columns of size (350mm X 350mm) symmetrically placed on both sides. Centre to Centre distance between two columns is 1500mm Depth of Footing = 600 mm 150mm Projection on all sides of footing for PCC Depth of PCC bed = 150mm

Depth of excavation pit below Ground Level = 1200mm

Q.4 Draw to scale 1:10 Front Elevation, Sectional Elevation and Sectional Plan 14 of a framed Teakwood Single Leaf Fully Glazed Window. Use following data:

Clear opening = 800mm X 1200mm

Wooden section for frame = 100mm X 60mm

Wooden section for style and rail = 100mm X 35mm

Glass Panel = 8mm thick (2 numbers per shutter)

Sash bar = 20mm thick

Show various fixtures at proper locations

Max. Marks: 56

28

Set Q

Draw to scale 1: 20 Plan and Sectional Elevation of a Quarter Turn RCC Staircase. Use following data: Height to be climbed = 3150mm Winders are not allowed Width of stair flights = 1000mm Riser = 150mm to 180mm Tread = 230mm to 300mm Railing = 80mm Stainless Steel Pipe Railing Waist slab = 150mm thick Reinforcement details not expected Write step by step calculation on sheet with pencil only.

E (Part - I) (Old) (CBCS) Examination N

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to the right indicate full marks.
 - 3) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 State whether following statements are correct or incorrect.

- 1) In case of load bearing structures, less carpet area is available.
- 2) The switch boards are fixed at sill height in residential buildings.
- 3) Extrados is inner curve of an arch.
- 4) Casing and capping is type of closed wiring.
- 5) Spouts are provided for transportation of bathroom waste water.
- 6) Normally for plastering mortar of CM 1:4 is used.
- 7) Plumbing systems involves installation of Telephone cables.

State whether the following statement is true or false.

- 8) Landing is a biggest tread or going of half turn staircase.
- 9) Voussoirs of an arch remains in tension.
- 10) Combined footing is used for single column.
- 11) If a modular brick is cut along width in half size then it is called as Queen Closer
- 12) Through stone is a stone stretcher.
- 13) Flemish bond has greater strength as compared to English bond.
- 14) Mullion divides door and window vertically.



Max. Marks: 70



Marks: 14

7

Set

R

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use half imperial sheet for section II and answer book for section I.
- 4) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. (any Seven)

- a) What is through stone? Explain its importance in masonry work.
- b) Compare Load bearing structure with framed structure.
- c) Draw neat sketches for any two of door hinges.
- d) Explain system of Air Conditioning in winter?
- e) Write a note on various defects in plastering?
- f) Write a note on: Thermal Insulation of Building.
- g) Draw a neat sketch of Gully Trap and Intercepting Trap.
- h) Define following terms:
 - 1) Queen Closer
 - 2) King Closer
 - 3) Closer
 - 4) Beveled closer
- i) Enlist various types of roofs? Discuss any two types of roof with their suitability.
- j) What is concept of earthing? Also explain procedure of earthing in brief?

Section - II

Q.3 Draw to scale 1:10 Elevation and Plan for alternate courses of STRETCHER Bond and HEADER Bond for L shaped wall.

OR

Draw to scale 1:20 Plan and Sectional Elevation for a RCC Rectangular Combined Footing of size (1200mm X 2400mm) with two columns of size (350mm X 350mm) symmetrically placed on both sides. Centre to Centre distance between two columns is 1500mm Depth of Footing = 600 mm 150mm Projection on all sides of footing for PCC Depth of PCC bed = 150mm

Depth of excavation pit below Ground Level = 1200mm

Q.4 Draw to scale 1:10 Front Elevation, Sectional Elevation and Sectional Plan 14 of a framed Teakwood Single Leaf Fully Glazed Window. Use following data:

Clear opening = 800mm X 1200mm

Wooden section for frame = 100mm X 60mm

Wooden section for style and rail = 100mm X 35mm

Glass Panel = 8mm thick (2 numbers per shutter)

Sash bar = 20mm thick

Show various fixtures at proper locations



28

Set R

Draw to scale 1: 20 Plan and Sectional Elevation of a Quarter Turn RCC Staircase. Use following data: Height to be climbed = 3150mm Winders are not allowed Width of stair flights = 1000mm Riser = 150mm to 180mm Tread = 230mm to 300mm Railing = 80mm Stainless Steel Pipe Railing Waist slab = 150mm thick Reinforcement details not expected Write step by step calculation on sheet with pencil only.

Set S

Max. Marks: 70

Marks: 14

7

7

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to the right indicate full marks.
 - 3) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 State whether following statements are correct or incorrect.

- 1) Casing and capping is type of closed wiring.
- 2) Spouts are provided for transportation of bathroom waste water.
- 3) Normally for plastering mortar of CM 1:4 is used.
- 4) Plumbing systems involves installation of Telephone cables.
- 5) In case of load bearing structures, less carpet area is available.
- 6) The switch boards are fixed at sill height in residential buildings.
- 7) Extrados is inner curve of an arch.

State whether the following statement is true or false.

- 8) If a modular brick is cut along width in half size then it is called as Queen Closer
- 9) Through stone is a stone stretcher.
- 10) Flemish bond has greater strength as compared to English bond.
- 11) Mullion divides door and window vertically.
- 12) Landing is a biggest tread or going of half turn staircase.
- 13) Voussoirs of an arch remains in tension.
- 14) Combined footing is used for single column.

Set | S

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use half imperial sheet for section II and answer book for section I.
- 4) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. (any Seven)

- a) What is through stone? Explain its importance in masonry work.
- b) Compare Load bearing structure with framed structure.
- c) Draw neat sketches for any two of door hinges.
- d) Explain system of Air Conditioning in winter?
- e) Write a note on various defects in plastering?
- f) Write a note on: Thermal Insulation of Building.
- g) Draw a neat sketch of Gully Trap and Intercepting Trap.
- h) Define following terms:
 - 1) Queen Closer
 - 2) King Closer
 - 3) Closer
 - 4) Beveled closer
- i) Enlist various types of roofs? Discuss any two types of roof with their suitability.
- j) What is concept of earthing? Also explain procedure of earthing in brief?

Section - II

Q.3 Draw to scale 1:10 Elevation and Plan for alternate courses of STRETCHER Bond and HEADER Bond for L shaped wall.

OR

Draw to scale 1:20 Plan and Sectional Elevation for a RCC Rectangular Combined Footing of size (1200mm X 2400mm) with two columns of size (350mm X 350mm) symmetrically placed on both sides. Centre to Centre distance between two columns is 1500mm Depth of Footing = 600 mm 150mm Projection on all sides of footing for PCC Depth of PCC bed = 150mm

Depth of excavation pit below Ground Level = 1200mm

Q.4 Draw to scale 1:10 Front Elevation, Sectional Elevation and Sectional Plan 14 of a framed Teakwood Single Leaf Fully Glazed Window. Use following data:

Clear opening = 800mm X 1200mm

Wooden section for frame = 100mm X 60mm

Wooden section for style and rail = 100mm X 35mm

Glass Panel = 8mm thick (2 numbers per shutter)

Sash bar = 20mm thick

Show various fixtures at proper locations



28
Set S

OR

Draw to scale 1: 20 Plan and Sectional Elevation of a Quarter Turn RCC Staircase. Use following data: Height to be climbed = 3150mm Winders are not allowed Width of stair flights = 1000mm Riser = 150mm to 180mm Tread = 230mm to 300mm Railing = 80mm Stainless Steel Pipe Railing Waist slab = 150mm thick Reinforcement details not expected Write step by step calculation on sheet with pencil only.

Set S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS -I Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Figures to the right indicate full marks. Assume correct data wherever necessary. 4) Use of non-programmable calculator is allowed. **MCQ/Objective Type Questions Duration: 30 Minutes** Marks: 14 Q.1 Choose the correct alternatives from the options. A _____ line is an imaginary line within the flow so that the tangent at any 1) point on It indicates velocity at that point.

streak line a) b) stream line path line d) none of the above c) 2) The flow in a pipe whose valve being opened or closed gradually is an 01 example of . steady flow b) unsteady flow a) rotational flow compressible flow c) d) 3) A real practical fluid possesses which of the following? viscosity surface tension a) b) c) density d) all the above 4) For a submerged body, if centre of buoyancy is above than C.G. of the 01 body, the body will remain in the state of . stable equilibrium neutral equilibrium a) b) unstable equilibrium d) any of the above c) 5) The continuity equation is based on the principle of _ 01 conservation of momentum conservation of mass b) a) C) conservation of energy d) none of the above The height of free surface above point is known as _____. 6) 01 static head b) intensity of pressure a) either of the above none of the above c) d) If the Reynold's no. is 3200, the flow in a pipe is _____ 7) 01 laminar turbulent a) b) transitional c) d) none of the above Darcy-Weisbach equation is used to find loss of head due to _____ 8) 01 Sudden enlargement Friction a) b) Sudden contraction c) d) None of the above 9) Loss of head due to entrance in pipe is given as _____. 01 $V^{2}/2g$ a) b) V/g $0.5v^2/2g$ $V^{3}/2g$ c) d)

SLR-FM-15

Ρ

14

01

No.

Seat

Max. Marks: 70

				SLR-FM	-15
				Set	Ρ
10)	Due a) b) c) d)	to which phenomenon wate Incompressibility Sudden opening of valve The material of pipe being Sudden closure of valve	er hammer i elastic	is caused?	01
11)	In w a) c)	hich of the devices, Bernoul Venturimeter Pitot tube	lli's equation b) d)	n is used? Orificemeter All the above	01
12)	The a) c)	co-efficient of discharge (C 0.95 to 0.99 0.8 to 0.85	d) of venturi b) d)	meter lies within the limit 0.7 to 0.8 0.6 to 0.7	01
13)	In a and pipe a) c)	pipe of 90 mm diameter wa at a gauge pressure of 350 is 10 m above the datum lin 40.88 m 43.88 m	ter is flowin kN/m ² , wha nes b) d)	g with mean velocity of 2 m/s at will be its total head if the 45.88 m 47.88 m	02

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS –I

Day & Date: Tuesday, 17-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to right indicate full marks.
- 3) Assume correct data wherever necessary.
- 4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following:

- a) Define and Write the Units.
 - 1) Viscosity
 - 2) Specific Gravity
 - 3) Compressibility
 - 4) Capillarity
- **b)** Explain the different types of pressures.
- c) Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in
 - 1) Water
 - 2) mercury

Take σ =0.0725N/m for water and σ =0.52N/m for mercury. The angle of contact for water is zero and for mercury 130°.

- d) A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.
- e) Write a note on Flow net and its applications.
- A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;
 - 1) Total pressure on the plate
 - 2) Centre of plate

Q.3 Solve any two of the following:

- a) Derive an expression for depth of centre of pressure from the free surface of water of an inclined Plane Surface submerged in the liquid.
- b) Explain:
 - 1) Steady and Unsteady flow
 - 2) Rotational and Irrotational flow
 - 3) Laminar and Turbulent flow
- c) The stream function is given by $\Psi = 5x 6y$ Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

Max. Marks: 56

16

12



Set

Section –II

Q.4 Solve any four of the following:

- a) Define Hydraulic Gradient Line and Total Energy Line (Draw neat sketch).
- **b)** Explain the phenomenon of drag and lift.
- c) Using Hazen Poisulle's equation obtain the expression for friction factor in terms of Reynold's number.
- d) Explain Syphon with neat sketch.
- e) The diameter of horizontal pipe is 150 mm is suddenly enlarged to 225 mm. The discharge is 0.05 m³/s. The intensity of pressure at 150 mm pipe is 110 kN/m². Calculate Loss of head due to Sudden enlargement.
- f) The difference in water surface level in two tanks which are connected by three pipes in series having the length 450 m, 255 m and 315 m having diameters 30 cm, 20 cm and 40 cm respectively is 18mts.Determine the rate flow if coefficient of friction 0.0075, 0.0078 and 0.0072 respectively for all pipes, considering Minro Losses.

Q.5 Solve any two of the following

- a) Derive Bernoulli's theorem for steady flow of an incompressible fluid and state assumptions made for the derivation.
- **b)** Derive Darcy-Weisbach equation for calculating loss of head due to friction.
- c) Find the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$, where u is the velocity at a distance y from the plate and u = U at

y= δ and δ = boundary layer thickness also calculate $\frac{\delta^*}{\alpha}$

12

		J.L	Civil Engin	eeri	nation Novi Dec-2019	
			FLUID MECH	ANI	CS –I	
Day Time	& Date : 10:0	e: Tue 0 AM	esday, 17-12-2019 To 01:00 PM		Max. Marks	s: 70
Instr	uction	าร: 1)	Q. No. 1 is compulsory and sho	uld b	e solved in first 30 minutes in ans	wer
		2) 3) 4)) Figures to the right indicate full) Assume correct data wherever) Use of non-programmable calc MCO/Objective Ty	mark nece ulator	s. ssary. is allowed.	
Dura	ition: 3	0 Mir	nutes	he a	Marks	s: 14
Q.1	Choo	ose th	ne correct alternatives from the	e opt	ions.	14
	1)	Darc a) c)	cy-Weisbach equation is used to Sudden enlargement Sudden contraction	find l b) d)	oss of head due to Friction None of the above	01
	2)	Loss a) c)	s of head due to entrance in pipe $V^2/2g$ $0.5v^2/2g$	is giv b) d)	ven as V/g V ³ /2g	01
	3)	Due a) b) c) d)	to which phenomenon water have Incompressibility Sudden opening of valve The material of pipe being elast Sudden closure of valve	mmer tic	is caused?	01
	4)	In wl a) c)	hich of the devices, Bernoulli's e Venturimeter Pitot tube	quatio b) d)	on is used? Orificemeter All the above	01
	5)	The a) c)	co-efficient of discharge (C _d) of v 0.95 to 0.99 0.8 to 0.85	ventu b) d)	rimeter lies within the limit 0.7 to 0.8 0.6 to 0.7	01
	6)	A poin a) c)	Iine is an imaginary line with t on It indicates velocity at that p streak line path line	nin the oint. b) d)	e flow so that the tangent at any stream line none of the above	01
	7)	The exar a) c)	flow in a pipe whose valve being nple of steady flow rotational flow	l opei b) d)	ned or closed gradually is an unsteady flow compressible flow	01
	8)	A rea a)	al practical fluid possesses which viscosity dopsity	n of th b) d)	ne following? surface tension	

c) density d) all the above SLR-FM-15

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019

Set Q

				SLR-FM-	15
				Set	Q
9)	For a body a) c)	submerged body, if centre of bu , the body will remain in the state stable equilibrium unstable equilibrium	uoyan e of _ b) d)	icy is above than C.G. of the neutral equilibrium any of the above	01
10)	The c a) c)	continuity equation is based on t conservation of momentum conservation of energy	he pri b) d)	nciple of conservation of mass none of the above	01
11)	The h a) c)	neight of free surface above poir static head either of the above	nt is k b) d)	nown as intensity of pressure none of the above	01
12)	lf the a) c)	Reynold's no. is 3200, the flow laminar transitional	in a p b) d)	ipe is turbulent none of the above	01
13)	In a p and a pipe i a) c)	bipe of 90 mm diameter water is at a gauge pressure of 350 kN/m is 10 m above the datum lines _ 40.88 m 43.88 m	flowir 1 ² , wh b) d)	ng with mean velocity of 2 m/s at will be its total head if the 45.88 m 47.88 m	02

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS –I

Day & Date: Tuesday, 17-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to right indicate full marks.
- 3) Assume correct data wherever necessary.
- 4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following:

- a) Define and Write the Units.
 - 1) Viscosity
 - 2) Specific Gravity
 - 3) Compressibility
 - 4) Capillarity
- **b)** Explain the different types of pressures.
- c) Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in
 - 1) Water
 - 2) mercury

Take σ =0.0725N/m for water and σ =0.52N/m for mercury. The angle of contact for water is zero and for mercury 130°.

- d) A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.
- e) Write a note on Flow net and its applications.
- A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;
 - 1) Total pressure on the plate
 - 2) Centre of plate

Q.3 Solve any two of the following:

- a) Derive an expression for depth of centre of pressure from the free surface of water of an inclined Plane Surface submerged in the liquid.
- b) Explain:
 - 1) Steady and Unsteady flow
 - 2) Rotational and Irrotational flow
 - 3) Laminar and Turbulent flow
- c) The stream function is given by $\Psi = 5x 6y$ Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

Max. Marks: 56

16

12



Set

SLR-FM-15 Set Q

Section –II

Q.4 Solve any four of the following:

- a) Define Hydraulic Gradient Line and Total Energy Line (Draw neat sketch).
- **b)** Explain the phenomenon of drag and lift.
- c) Using Hazen Poisulle's equation obtain the expression for friction factor in terms of Reynold's number.
- d) Explain Syphon with neat sketch.
- e) The diameter of horizontal pipe is 150 mm is suddenly enlarged to 225 mm. The discharge is 0.05 m³/s. The intensity of pressure at 150 mm pipe is 110 kN/m². Calculate Loss of head due to Sudden enlargement.
- f) The difference in water surface level in two tanks which are connected by three pipes in series having the length 450 m, 255 m and 315 m having diameters 30 cm, 20 cm and 40 cm respectively is 18mts.Determine the rate flow if coefficient of friction 0.0075, 0.0078 and 0.0072 respectively for all pipes, considering Minro Losses.

Q.5 Solve any two of the following

- a) Derive Bernoulli's theorem for steady flow of an incompressible fluid and state assumptions made for the derivation.
- **b)** Derive Darcy-Weisbach equation for calculating loss of head due to friction.
- c) Find the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$, where u is the velocity at a distance y from the plate and u = U at

y= δ and δ = boundary layer thickness also calculate $\frac{\delta^*}{\alpha}$

12

Seat No.	Set F	२
S.E. (Part - I) (Old) (CBCS) Examination Nov/D)ec-2019	
Civil Engineering		
Day & Date: Tuesday, 17-12-2019	Max. Marks: 7	'0
Time: 10:00 AM To 01:00 PM	00 · / ·	
Instructions: 1) Q. No. 1 is compulsory and should be solved in first book.	30 minutes in answei	r
 2) Figures to the right indicate full marks. 2) Assume correct data wherever personality 		
4) Use of non-programmable calculator is allowed.		
MCQ/Objective Type Questions	Marke: 1	i A
Q.1 Choose the correct alternatives from the options.	1 Iviai KS. 1	4
1) In which of the devices, Bernoulli's equation is used?	0)1
a) Venturimeter b) Orificemeter c) Pitot tube d) All the above		
2) The co-efficient of discharge (C_d) of venturimeter lies with	in the limit 0)1
a) 0.95 to 0.99 b) 0.7 to 0.8 c) 0.8 to 0.85 d) 0.6 to 0.7		
3) A line is an imaginary line within the flow so that th	e tangent at any 0)1
point on It indicates velocity at that point.		
a) streak line b) stream line c) path line d) none of the ab	ove	
4) The flow in a pipe whose valve being opened or closed gr	adually is an 0)1
example of a) steady flow b) unsteady flow		
c) rotational flow d) compressible f	low	
5) A real practical fluid possesses which of the following?		
a) viscosity b) sufface tension c) density d) all the above	٦	
6) For a submerged body, if centre of buoyancy is above that	In C.G. of the 0)1
body, the body will remain in the state of	rium	
c) unstable equilibrium d) any of the abo	ve	
7) The continuity equation is based on the principle of	0)1
c) conservation of momentum b) conservation of conservation of energy d) none of the ab	or mass ove	
8) The height of free surface above point is known as	<u>.</u> 0)1
a) static head b) intensity of pre	SSURE	
9) If the Reynold's no. is 3200, the flow in a pipe is	0)1
a) laminar b) turbulent		

SLR-FM-15

				SLR-FM-	15
				Set	R
10)	Darc a) c)	cy-Weisbach equation is used to Sudden enlargement Sudden contraction	find lo b) d)	oss of head due to Friction None of the above	01
11)	Loss a) c)	of head due to entrance in pipe $V^2/2g$ $0.5v^2/2g$	is giv b) d)	en as <i>V/g</i> <i>V</i> ³ /2 <i>g</i>	01
12)	Due a) b) c) d)	to which phenomenon water har Incompressibility Sudden opening of valve The material of pipe being elast Sudden closure of valve	nmer ic	is caused?	01
13)	In a and pipe a) c)	pipe of 90 mm diameter water is at a gauge pressure of 350 kN/m is 10 m above the datum lines _ 40.88 m 43.88 m	flowii l ² , wh b) d)	ng with mean velocity of 2 m/s at will be its total head if the 45.88 m 47.88 m	02

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS –I

Day & Date: Tuesday, 17-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to right indicate full marks.
- 3) Assume correct data wherever necessary.
- 4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following:

- a) Define and Write the Units.
 - 1) Viscosity
 - 2) Specific Gravity
 - 3) Compressibility
 - 4) Capillarity
- **b)** Explain the different types of pressures.
- c) Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in
 - 1) Water
 - 2) mercury

Take σ =0.0725N/m for water and σ =0.52N/m for mercury. The angle of contact for water is zero and for mercury 130°.

- d) A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.
- e) Write a note on Flow net and its applications.
- A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;
 - 1) Total pressure on the plate
 - 2) Centre of plate

Q.3 Solve any two of the following:

- a) Derive an expression for depth of centre of pressure from the free surface of water of an inclined Plane Surface submerged in the liquid.
- b) Explain:
 - 1) Steady and Unsteady flow
 - 2) Rotational and Irrotational flow
 - 3) Laminar and Turbulent flow
- c) The stream function is given by $\Psi = 5x 6y$ Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

Max. Marks: 56

16

12



Set

SLR-FM-15 Set R

Section –II

Q.4 Solve any four of the following:

- a) Define Hydraulic Gradient Line and Total Energy Line (Draw neat sketch).
- **b)** Explain the phenomenon of drag and lift.
- c) Using Hazen Poisulle's equation obtain the expression for friction factor in terms of Reynold's number.
- d) Explain Syphon with neat sketch.
- e) The diameter of horizontal pipe is 150 mm is suddenly enlarged to 225 mm. The discharge is 0.05 m³/s. The intensity of pressure at 150 mm pipe is 110 kN/m². Calculate Loss of head due to Sudden enlargement.
- f) The difference in water surface level in two tanks which are connected by three pipes in series having the length 450 m, 255 m and 315 m having diameters 30 cm, 20 cm and 40 cm respectively is 18mts.Determine the rate flow if coefficient of friction 0.0075, 0.0078 and 0.0072 respectively for all pipes, considering Minro Losses.

Q.5 Solve any two of the following

- a) Derive Bernoulli's theorem for steady flow of an incompressible fluid and state assumptions made for the derivation.
- **b)** Derive Darcy-Weisbach equation for calculating loss of head due to friction.
- c) Find the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$, where u is the velocity at a distance y from the plate and u = U at

y= δ and δ = boundary layer thickness also calculate $\frac{\delta^*}{\alpha}$

12

0				
Seat			Set	S
		S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS –I		L
Day & Time	& Date : 10:0	re: Tuesday, 17-12-2019 Ma 00 AM To 01:00 PM	x. Marks	s: 70
Instr	uctio	 ns: 1) Q. No. 1 is compulsory and should be solved in first 30 minuter book. 2) Figures to the right indicate full marks. 3) Assume correct data wherever necessary. 4) Use of non-programmable calculator is allowed. 	s in ansv	wer
Dura	tion ?	MCQ/Objective Type Questions	Marks	· 14
01	Cho	ose the correct alternatives from the options	maria	. 14
Q. 1	1)	The height of free surface above point is known as a) static head b) intensity of pressure c) either of the above d) none of the above		01
	2)	If the Reynold's no. is 3200, the flow in a pipe is a) laminar b) turbulent c) transitional d) none of the above		01
	3)	Darcy-Weisbach equation is used to find loss of head due toa)Sudden enlargementb)Frictionc)Sudden contractiond)None of the above		01
	4)	Loss of head due to entrance in pipe is given as a) $V^2/2g$ b) V/g c) $0.5v^2/2g$ d) $V^3/2g$		01
	5)	 Due to which phenomenon water hammer is caused? a) Incompressibility b) Sudden opening of valve c) The material of pipe being elastic d) Sudden closure of valve 		01
	6)	In which of the devices, Bernoulli's equation is used? a) Venturimeter b) Orificemeter c) Pitot tube d) All the above		01

The co-efficient of discharge (C_d) of venturimeter lies within the limit _____. 7) 0.95 to 0.99 0.7 to 0.8 a) b) C) 0.8 to 0.85 d) 0.6 to 0.7 8)

A _____ line is an imaginary line within the flow so that the tangent at any 01 point on It indicates velocity at that point. a) streak line b) stream line d) C) path line none of the above The flow in a pipe whose valve being opened or closed gradually is an 01 9) example of _____.

- steady flow b) unsteady flow a)
- rotational flow compressible flow C) d)

SLR-FM-15

				SLR-FM-	·15
				Set	S
10)	A re a) c)	al practical fluid possesses whic viscosity density	h of th b) d)	ne following? surface tension all the above	
11)	For body a) c)	a submerged body, if centre of b y, the body will remain in the sta stable equilibrium unstable equilibrium	uoyar te of _ b) d)	ncy is above than C.G. of the neutral equilibrium any of the above	01
12)	The a) c)	continuity equation is based on conservation of momentum conservation of energy	the pr b) d)	inciple of conservation of mass none of the above	01
13)	In a and pipe a) c)	pipe of 90 mm diameter water is at a gauge pressure of 350 kN/r is 10 m above the datum lines 40.88 m 43.88 m	flowi n ² , wł b) d)	ng with mean velocity of 2 m/s hat will be its total head if the 45.88 m 47.88 m	02

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS –I

Day & Date: Tuesday, 17-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to right indicate full marks.
- 3) Assume correct data wherever necessary.
- 4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following:

- a) Define and Write the Units.
 - 1) Viscosity
 - 2) Specific Gravity
 - 3) Compressibility
 - 4) Capillarity
- **b)** Explain the different types of pressures.
- c) Calculate the capillary rise in a glass tube of 2.5 mm diameter when immersed vertically in
 - 1) Water
 - 2) mercury

Take σ =0.0725N/m for water and σ =0.52N/m for mercury. The angle of contact for water is zero and for mercury 130°.

- d) A uniform body of size 3m long, 2m wide and 1m deep floats in water. What is the weight of body if depth of immersion is 0.8m? Determine the metacentric height also.
- e) Write a note on Flow net and its applications.
- A rectangular plate 3 m long and 1 m wide is immersed vertically in water in such a way that 3 m side is parallel to water surface and 1 m below it. Determine;
 - 1) Total pressure on the plate
 - 2) Centre of plate

Q.3 Solve any two of the following:

- a) Derive an expression for depth of centre of pressure from the free surface of water of an inclined Plane Surface submerged in the liquid.
- b) Explain:
 - 1) Steady and Unsteady flow
 - 2) Rotational and Irrotational flow
 - 3) Laminar and Turbulent flow
- c) The stream function is given by $\Psi = 5x 6y$ Calculate the velocity components. Also find magnitude and direction of the resultant velocity at any point.

Max. Marks: 56

16

12

SLR-FM-15

Set

Section –II

Q.4 Solve any four of the following:

- a) Define Hydraulic Gradient Line and Total Energy Line (Draw neat sketch).
- **b)** Explain the phenomenon of drag and lift.
- c) Using Hazen Poisulle's equation obtain the expression for friction factor in terms of Reynold's number.
- d) Explain Syphon with neat sketch.
- e) The diameter of horizontal pipe is 150 mm is suddenly enlarged to 225 mm. The discharge is 0.05 m³/s. The intensity of pressure at 150 mm pipe is 110 kN/m². Calculate Loss of head due to Sudden enlargement.
- f) The difference in water surface level in two tanks which are connected by three pipes in series having the length 450 m, 255 m and 315 m having diameters 30 cm, 20 cm and 40 cm respectively is 18mts.Determine the rate flow if coefficient of friction 0.0075, 0.0078 and 0.0072 respectively for all pipes, considering Minro Losses.

Q.5 Solve any two of the following

- a) Derive Bernoulli's theorem for steady flow of an incompressible fluid and state assumptions made for the derivation.
- **b)** Derive Darcy-Weisbach equation for calculating loss of head due to friction.
- c) Find the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$, where u is the velocity at a distance y from the plate and u = U at

y= δ and δ = boundary layer thickness also calculate $\frac{\delta^*}{\alpha}$

12

			ENGINEERIN	G GEO	ĽOGY	
Day Time	& Date	e: Thu	ursday, 19-12-2019		Max.	Marks: 7
Instr	uctior	ns: 1)) Q. No. 1 is compulsory and s book.	should be	e solved in first 30 minutes	in answe
		2) 3)) Draw neat and labeled diagra) Figures to the right indicates	am where full mark	ever necessary. s.	
-			MCQ/Objective	Гуре Q	uestions	
Dura	tion: 3	SO Mir	nutes			Marks: 1
Q.1		Gab Gab	he correct alternatives from the dolerite and basalt have s	ame optic	ons.	1
	')	a) c)	Texture Cooling history	b) d)	Composition Structural deformation	
	2)	Whia a) b) c) d)	ch of the following statement is In non-conformity older bed is In non-conformity older bed is In non-conformity older bed is In non-conformity older bed is	s true? s made u s made u s made u s made u	Ip of sedimentary rock Ip of plutonic igneous rock Ip of metamorphic rock Ip of volcanic igneous rock	
	3)	The a) c)	crystalline variety of silica is _ Chalcedony Opal	b) d)	Amethyst Flint	
	4)	Whic a)	ch one of the following is not pa Crater	art of vol b)	cano? Conduit	
		c)	Calderas	d)	Delta	
	5)	Feld	spar group of minerals are cha	aracterize	ed by	
		a) c)	7 hardness 5 hardness	b) d)	6 hardness 8 hardness	
	6)	Cros	ss bedding is commonly found	in		
		a)	Shale	b)	Gypsum	
		c)	Sandstone	d)	Rock salt	
	7)	A fol	liated metamorphic rock with a eral is	Iternating	g layers of light and dark	
		a)	Schist	b)	Slate	
		c)	Gneisos	d)	Marble	
	8)	Slop	ing surface of valley upon which	ch dam r	ests is known as	
		a)	Heel	b)	Abutment Bior	
	0)	U) Tha		u)	FICI	
	9)	ne a)	Core run	called as b)	Core recovery	
		c)	Core draw	d)	Core loss	
	10)	A tu	nnel should not be constructed	lalong		
	,	a)	Dip direction	b) _	Strike direction	
		C)	Oblique to the bed attitude	d)	Both along a & b	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering

Seat

No.

SLR-FM-16

0

Set P

4

- 11) The capacity of rock to withstand bending loads is termed as _____.
 - a) Compressive strength
- b) Shear strength

Set P

- c) Tensile strength
- d) Crushing strength
- 12) Which rock is not suitable for dam foundation _____
 - a) Siliceous sandstonec) Massive limestone
- b) Shaled) None of these
- 13) For the safe and stable construction of dam the correct geological condition would be _____.
 - a) At crest of fold limbs dipping upstream
 - b) At trough of fold
 - c) At limb of fold
 - d) None of these
- 14) Nature of river at bridge site should be _____.
 - a) Be scouring and erosive
 - b) Be non-scouring and low velocity of current
 - c) Have high velocity of current
 - d) Have high silt

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 **Čivil Engineering** ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram wherever necessary.

Section I

Q.2	a) b)	 Define joint and explain classification of joints based on origin. Define igneous rock and explain classification of igneous rock based on. i) colour index ii) depth of formation iii) Silica percentage 	06 06			
		OR				
Q.3	a) b)	Define metamorphic rock and explain structures of metamorphic rock. Define fault and explain civil engineering significance of fault.	06 06			
Q.4	Wha	at is an earthquake? Describe causes and effect of earthquake. OR	07			
Q.5	Defi slide	ne landslide. Explain in detail causes and preventive measures of land	07			
Q.6	Writ a) b) c) d) e)	 Write a note on any three. a) Hornblend mineral b) Lithification and digenesis c) Disconformities d) Dip slip and strike slip fault e) Residual mountains 				
		Section –II				
Q.7	a)	What is building stone? Describe geological and strength properties of good Building stone.	06			
	b)	Explain in detail subsurface investigation. OR	06			
Q.8	a) b)	What is exploratory drilling? Explain diamond and calyx drilling. Define reservoir and explain water tightness and influencing factor of reservoir.	06 06			
Q.9	De	fine tunnel. Explain tunneling through horizontal bed and folded strata. OR	07			
Q.10	Explain in detail crushing strength of the rock.					

Max. Marks: 56

Set | P

SLR-FM-16 Set P 09

Q.11

- Write a note on (any three)a) Earth fill dam and rock fill dam a)
- Siltation of reservoir b)
- Dams on carbonate rock C)
- Modulus of elasticity of rock d)
- Single span bridge e)

	SLR-FM-16)
Seat	Set Q	
110.	S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY	
Day &	Date: Thursday, 19-12-2019 Max. Marks: 70)
lime: 1	I0:00 AM_I0 01:00 PM Stions: 1)_O_No_1 is compulsory and should be solved in first 30 minutes in answer	,
	 a) Figures to the right indicates full marks. MCQ/Objective Type Questions 	
Duratio	on: 30 Minutes Marks: 14	ł
Q.1 C 1	choose the correct alternatives from the options. 14) Sloping surface of valley upon which dam rests is known as 14 a) Heel b) Abutment c) Toe d) Pier	ļ
2) The length of the core obtained is called as a) Core run b) Core recovery c) Core draw d) Core loss	
3	 A tunnel should not be constructed along a) Dip direction b) Strike direction c) Oblique to the bed attitude d) Both along a & b 	
4) The capacity of rock to withstand bending loads is termed as <u>.</u> a) Compressive strength b) Shear strength c) Tensile strength d) Crushing strength	
5) Which rock is not suitable for dam foundation a) Siliceous sandstone b) Shale c) Massive limestone d) None of these	
6	 For the safe and stable construction of dam the correct geological condition would be a) At crest of fold limbs dipping upstream b) At trough of fold c) At limb of fold d) None of these 	
7	 Nature of river at bridge site should be a) Be scouring and erosive b) Be non-scouring and low velocity of current c) Have high velocity of current d) Have high silt 	
8) Gabbro, dolerite and basalt have same a) Texture b) Composition c) Cooling history d) Structural deformation	
9	 Which of the following statement is true? a) In non-conformity older bed is made up of sedimentary rock b) In non-conformity older bed is made up of plutonic igneous rock c) In non-conformity older bed is made up of metamorphic rock d) In non-conformity older bed is made up of volcanic igneous rock 	

10) The crystalline variety of silica is _____ _. Chalcedony Amethyst a) b) Opal c) d) Flint Which one of the following is not part of volcano? 11) Crater Conduit a) b) c) Calderas d) Delta Feldspar group of minerals are characterized by _____. 12) 7 hardness 6 hardness a) b) 5 hardness d) 8 hardness C) 13) Cross bedding is commonly found in _ b) Shale Gypsum a) Sandstone Rock salt C) d) A foliated metamorphic rock with alternating layers of light and dark 14) mineral is _____. Schist Slate b) a)

c) Gneisos d) Marble

SLR-FM-16

Set | Q

S.E. (Part - I) (Old) (CBCS) Examinatio

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Q.2

a)

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram wherever necessary.

Define joint and explain classification of joints based on origin.

Section I

	b)	 Define igneous rock and explain classification of igneous rock based on. i) colour index ii) depth of formation iii) Silica percentage 	06			
		OR				
Q.3	a) b)	Define metamorphic rock and explain structures of metamorphic rock. Define fault and explain civil engineering significance of fault.	06 06			
Q.4	Wha	at is an earthquake? Describe causes and effect of earthquake. OR	07			
Q.5	Defi slide	ne landslide. Explain in detail causes and preventive measures of land	07			
Q.6	Writ a) b) c) d) e)	ite a note on any three. Hornblend mineral Lithification and digenesis Disconformities Dip slip and strike slip fault Residual mountains				
		Section –II				
Q.7	a)	What is building stone? Describe geological and strength properties of good Building stone.	06			
	b)	Explain in detail subsurface investigation. OR	06			
Q.8	a) b)	What is exploratory drilling? Explain diamond and calyx drilling. Define reservoir and explain water tightness and influencing factor of reservoir.	06 06			
Q.9	De	fine tunnel. Explain tunneling through horizontal bed and folded strata. OR	07			
Q.10	Explain in detail crushing strength of the rock.					

Max. Marks: 56

06

SLR-FM-16

Set | Q

SLR-FM-16 Set Q 09

Q.11

- Write a note on (any three)a) Earth fill dam and rock fill dam a)
- Siltation of reservoir b)
- Dams on carbonate rock C)
- Modulus of elasticity of rock d)
- Single span bridge e)

Seat No.						Set	R
		S.E. (Part -) (Old) (CBCS)) Examin	ation Nov/Dec-2019		
				gineerin	g		
Day 8	Data	. Thursday 10		NG GEO	LOGY	Marka	· 70
Time:	10:00	0 AM To 01:00 I	PM		Iviax.	Marks	. 70
Instru	ctior	ns: 1) Q. No. 1 book.	is compulsory and	d should be	e solved in first 30 minutes	in ans	wer
		2) Draw nea 3) Figures to	t and labeled diag the right indicate	gram where s full mark	ever necessary. s.		
		I	MCQ/Objective	e Type Q	uestions		
Duratio	on: 3	0 Minutes				Marks	: 14
Q.1 C	Choo	se the correct	alternatives from	n the optic	ons.		14
I)	a) 7 hardnes	SS	haracterize	6 hardness		
		c) 5 hardnes	SS	d)	8 hardness		
2	2)	Cross bedding	is commonly foun	id in			
	,	a) Shale	,	b)	Gypsum		
		c) Sandston	e	d)	Rock salt		
3	3)	A foliated meta	morphic rock with	alternating	g layers of light and dark		
		mineral is	·	b)	Slata		
		c) Gneisos		d)	Marble		
4	1)	Sloping surface	e of valley upon wl	, hich dam r	ests is known as		
	,	a) Heel		b)	Abutment		
		c) Toe		d)	Pier		
5	5)	The length of the	ne core obtained is	s called as	·		
		a) Core run		b)	Core recovery		
	• •		V 	u)			
6	5)	A tunnel snould	i not be constructe	ed along _ b)	 Strike direction		
		c) Oblique to	the bed attitude	d)	Both along a & b		
7	7)	The capacity of	f rock to withstand	, I bendina l	oads is termed as		
•	,	a) Compress	sive strength	b)	Shear strength	-	
		c) Tensile st	rength	d)	Crushing strength		
8	3)	Which rock is r	ot suitable for dar	n foundatio	on		
		a) Siliceous	sandstone	b)	Shale		
_		c) Massive I	Imestone	d)	None of these		
9	9)	For the safe an	d stable construct	tion of dam	n the correct geological		
		a) At crest o	r be f fold limbs dinning	a upstream	n		
		b) At trough	of fold	y apolicali			
		c) At limb of	fold				

- 10) Nature of river at bridge site should be _____.
 - Be scouring and erosive a)
 - Be non-scouring and low velocity of current b)
 - Have high velocity of current C)
 - Have high silt d)

11) Gabbro, dolerite and basalt have same _

- Composition Texture b) a)
- Structural deformation Cooling history d) C)
- Which of the following statement is true? 12)
 - In non-conformity older bed is made up of sedimentary rock a)
 - In non-conformity older bed is made up of plutonic igneous rock b)
 - In non-conformity older bed is made up of metamorphic rock c)
 - In non-conformity older bed is made up of volcanic igneous rock d)

The crystalline variety of silica is _____ 13)

- Chalcedony b) Amethyst a)
- C) Opal d) Flint

14) Which one of the following is not part of volcano?

- Crater b) Conduit a)
- c) Calderas

- d) Delta

Seat No.

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram wherever necessary.

Section I

Q.2	a) b)	 Define joint and explain classification of joints based on origin. Define igneous rock and explain classification of igneous rock based on. i) colour index ii) depth of formation iii) Silica percentage 	06 06		
		OR			
Q.3	a) b)	Define metamorphic rock and explain structures of metamorphic rock. Define fault and explain civil engineering significance of fault.	06 06		
Q.4	Wha	nat is an earthquake? Describe causes and effect of earthquake. 07 OR			
Q.5	Defi slide	Define landslide. Explain in detail causes and preventive measures of land 07 slide.			
Q.6	Writ a) b) c) d) e)	te a note on any three. Hornblend mineral Lithification and digenesis Disconformities Dip slip and strike slip fault Residual mountains	09		
		Section –II			
Q.7	a)	What is building stone? Describe geological and strength properties of good Building stone.	06		
	b)	Explain in detail subsurface investigation. OR	06		
Q.8	a) b)	What is exploratory drilling? Explain diamond and calyx drilling. Define reservoir and explain water tightness and influencing factor of reservoir.	06 06		
Q.9	Define tunnel. Explain tunneling through horizontal bed and folded strata. 0 0				
Q.10	Explain in detail crushing strength of the rock. 0				

Max. Marks: 56

Set | R

SLR-FM-16 Set R 09

Q.11

- Write a note on (any three)a) Earth fill dam and rock fill dam a)
- Siltation of reservoir b)
- C) Dams on carbonate rock
- Modulus of elasticity of rock d)
- Single span bridge e)

							S	LR-FM-	·16
Seat No.								Set	S
		S.E	. (Part - I) (Old) (CB Civi ENGINE	CS) Exa I Engine ERING (amin eerin GEO	ation Nov/Dec-20 g LOGY	19	
Day &	Date	e: Thu	ırsday, 19-	12-2019				Max. Marks	5: 70
Time:	10:00	D AM	To 01:00 F	M					
Instru	ctior	is: 1)	Q. No. 1 i	s compulsory	and shou	uld be	e solved in first 30 mir	nutes in ans	wer
		2) 3)	Draw neat Figures to	and labeled the right indi	diagram v cates full	where mark	ever necessary. s.		
D (1		~ • •	N	/ICQ/Objec	tive Typ	be Q	uestions		
Duratio	on: 3	0 Min	utes		from the	t : -		Marks	5:14
Q.1 (unoo 1)	A tur	nel should	not be const	ructed alc	optic ong			14
	,	a) c)	Dip directi Oblique to	on the bed attit	ude	b) d)	Strike direction Both along a & b		
2	2)	The (a) c)	capacity of Compress Tensile str	rock to withs ive strength ength	tand bend	ding la b) d)	bads is termed as Shear strength Crushing strength	<u>.</u>	
3	3)	Whic a) c)	th rock is no Siliceous s Massive lii	ot suitable fo sandstone mestone	r dam fou	ndatio b) d)	on Shale None of these		
2	4)	For t cond a) b) c) d)	he safe and ition would At crest of At trough of At limb of None of th	d stable cons be fold limbs di of fold fold iese	truction o	f dam tream	the correct geologica	al	
Ę	5)	Natu a) b) c) d)	re of river a Be scourir Be non-sc Have high Have high	at bridge site ng and erosiv ouring and lo velocity of co silt	should be e w velocity urrent	e / of cu	<u> .</u> urrent		
6	6)	Gabl a) c)	oro, dolerite Texture Cooling hi	e and basalt l story	nave same	e b) d)	 Composition Structural deformation	on	
7	7)	Whic a) b) c) d)	h of the fol In non-cor In non-cor In non-cor In non-cor	lowing staten formity older nformity older nformity older nformity older	nent is tru bed is ma bed is ma bed is ma bed is ma	ie? ade u ade u ade u ade u	p of sedimentary rocl p of plutonic igneous p of metamorphic roc p of volcanic igneous	k rock sk rock	
8	3)	The a) c)	crystalline Chalcedor Opal	variety of silic	a is	 b) d)	Amethyst Flint		
ę	9)	Whic a)	h one of th Crater	e following is	not part o	of vol b)	cano? Conduit		

Calderas Delta C) d)

10)	Feldspar group	of minerals are	characterized by	/
10)	i olaopai gioap		onunuotonzou by	

- 7 hardness 6 hardness a) b)
- 5 hardness 8 hardness d) C)
- Cross bedding is commonly found in _ 11)

a)

Heel

- Gypsum Shale b) a)
- C) Sandstone d) Rock salt
- A foliated metamorphic rock with alternating layers of light and dark 12) mineral is _ .
 - a) Schist b) Slate
 - C) Gneisos d) Marble
- 13) Sloping surface of valley upon which dam rests is known as _____.
 - b) Abutment

.

- c) Toe d) Pier
- The length of the core obtained is called as _ 14)
 - Core run b) Core recovery a) C)
 - Core draw d) Core loss

SLR-FM-16

Set S

Seat	
No.	

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram wherever necessary.

Section I

Q.2	a) b)	 Define joint and explain classification of joints based on origin. Define igneous rock and explain classification of igneous rock based on. i) colour index ii) depth of formation iii) Silica percentage 	06 06			
		OR				
Q.3	a) b)	Define metamorphic rock and explain structures of metamorphic rock. Define fault and explain civil engineering significance of fault.	06 06			
Q.4	Wha	at is an earthquake? Describe causes and effect of earthquake. OR	07			
Q.5	Defi slide	ne landslide. Explain in detail causes and preventive measures of land	07			
Q.6	Writ a) b) c) d) e)	te a note on any three. Hornblend mineral Lithification and digenesis Disconformities Dip slip and strike slip fault Residual mountains	09			
		Section –II				
Q.7	a)	What is building stone? Describe geological and strength properties of good Building stone.	06			
	b)	 b) Explain in detail subsurface investigation. OR 				
Q.8	a) b)	What is exploratory drilling? Explain diamond and calyx drilling. Define reservoir and explain water tightness and influencing factor of reservoir.	06 06			
Q.9	De	Define tunnel. Explain tunneling through horizontal bed and folded strata. 0 0				
Q.10	Explain in detail crushing strength of the rock. 0					

Max. Marks: 56

Set S

SLR-FM-16 Set S 09

Q.11

- Write a note on (any three)a) Earth fill dam and rock fill dam a)
- Siltation of reservoir b)
- C) Dams on carbonate rock
- Modulus of elasticity of rock d)
- Single span bridge e)

Seat No.

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- 1) Buckling of long column occurs under _
 - a) Axial load b) Transverse load
 - c) Direct load d) None
- 2) The equivalent length is equal to half the actual length of a column with ______
 a) One end fixed other end free
 - b) Both ends fixed
 - c) Both ends hinged
 - d) One end fixed other end hinged
- 3) The maximum shear stress on principal plane is _____.
 - a) Twice of minimum principal stress
 - b) Zero
 - c) Twice of maximum principal stress
 - d) One
- 4) Mohr's circle is graphical method to find _____.
 - a) Bending stresses
 - b) Buckling Stresses
 - c) Maximum Shear Stresses
 - d) None

a) $\sqrt{M^2 + T^2}$

5) The equivalent Twisting moment under combined action of bending moment M and Torque T is _____.

c)
$$\frac{1}{2}M\sqrt{M^2 + T^2}$$

b) $\frac{1}{2}\sqrt{M^2 - T^2}$ d) $\frac{1}{2}\left(M + \sqrt{M^2 + T^2}\right)$

- 6) Every cross section of the shaft, which is subjected to a twisting moment is under _____.
 - a) Compressive stress b) Tensile stress
 - c) Bending stress d) Shear stress
- 7) Maximum principal stress theory was postulated by _____
 - a) Rankineb) St. Venantc) Mohrd) Tresca

SLR-FM-17



Max. Marks: 70

Marks: 14

- 8) The simply supported beam of span 1, is carrying point load W at mid span. What is the deflection at centre of the beam?
 - a) $Wl^2 / 48 EI$ Wl³/48 EI b)
 - c) $5Wl^3/348 EI$ d) 11 Wl³ 120 EI
- 9) The simply supported beam of span 1, is carrying uniformly distributed load of w per unit run over the whole span. What is the maximum deflection of the beam?
 - Wl³/30 EI a) $Wl^4/48 EI$ b) $5Wl^4$ d) Wl⁴/384 EI C) 384EI
- 10) Maximum bending moment due to moving load on simply supported beam occurs
 - a) At the mid span
 - under the load C)
 - 11) Castigliano's theorem is valid for _____
 - b) nonlinear structure a) any structure
 - c) linear structure d) any of the above
 - A curve or graph that represents a function like, reaction at supports, the 12) shear force at the section, the bending moment at a section of structure etc, for various positions of unit load of the span of the structure is called _____.
 - a) influence line diagram
- b) radial stress diagram None of these d)
- shear stress diagram c)
- The beam subjected to bending, amount of strain energy stored in the 13) beam .
 - a) $\int M^2 / 2EI \, dx$
- $\int M^2 / EI dx$ b)
- $\int M^3 / 2EI dx$ c) $\int M^2 / 3EI dx$ d)
- Conjugate beam method or method of elastic weight is useful for the 14) beam of
 - a) uniform EI
 - c) both a & b

- non uniform EI b)
- d) none of the above

anywhere on the beam d)

SLR-FM-17

Set P

- - b) at the supports

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 1) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

Section – I

- Q.2 State the assumptions in Euler's Theory. Derive the formula for crippling load in 10 case of long column having both the ends hinged.
- Q.3 Define Principal stresses and Principal Plane. a)
 - Two wooden pieces 10 cm x 10 cm in cross section are glued together b) 07 along line BC as shown in figure 1 what axial force "P" can be applied if the allowable shearing stress along BC is 1.4 N/mm^2 .



A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and

Q.5 Determine the diameter of a bolt which is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN using

- Maximum principal stress theory. a)
- Maximum principal strain theory. b)

Given the Elastic limit in tension is 225 N/mm², factor of safety is 3 and Poisson's ratio is 0.3

Section – II

What is deflection of beam? Q.6 a)

Q.4

A steel girder of uniform cross section, 14 meters long is simply supported 07 b) at its ends. It carries Concentrated loads as shown in figure find deflection under point loads A and B.

Use Macaulay's method. Take E =210 x 10^{6} KN/m²,I = 64 x 10^{-4} m⁴

 $C \uparrow A \qquad B \uparrow D \\ + 3m + 6.5m + 4.5m + 1$

P 30° figure 1(Q.no.3)



Max. Marks: 56

Set

02

09

09
Set P

Q.7 A beam of span 10 m carries concentrated load of 20 KN at mid span. Find the central deflection. Use strain energy method (first theorem of Castigliano). Assume uniform flexural rigidity EI.



- **Q.8 a)** Castigliano's first theorem.
 - A three hinged parabolic arch of span 20 meters and central rise of 5 meters carries a point load of 200 KN at 6 meters from the left hand support as shown in figure. Find horizontal thrust and support reactions at A and B.



Q.9 Two wheel loads 80 KN and 200 KN, spaced 2m apart move on a girder of span 09 16 m. Find maximum bending moment at a section 6 m from the left end. Use influence line method. Any load can lead the other.



Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - The simply supported beam of span 1, is carrying point load W at mid 1) span. What is the deflection at centre of the beam?
 - a) $Wl^2 / 48 EI$ Wl³/48 EI b) c) $5Wl^3/348 EI$ 11 Wl³ d)
 - 2) The simply supported beam of span 1, is carrying uniformly distributed load of w per unit run over the whole span. What is the maximum deflection of the beam?
 - a) $Wl^4/48 EI$ $Wl^3/30 EI$ b) 5Wl⁴ d) Wl⁴/384 EI C)
 - 384EI
 - 3) Maximum bending moment due to moving load on simply supported beam occurs
 - a) At the mid span at the supports b) anywhere on the beam
 - c) under the load d)
 - 4) Castigliano's theorem is valid for
 - a) any structure b) nonlinear structure
 - c) linear structure any of the above d)
 - A curve or graph that represents a function like, reaction at supports, the 5) shear force at the section, the bending moment at a section of structure etc, for various positions of unit load of the span of the structure is called _____.
 - a) influence line diagram b) radial stress diagram
 - c) shear stress diagram d) None of these
 - 6) The beam subjected to bending, amount of strain energy stored in the beam
 - $\int M^2 / EI dx$ a) $\int M^2 / 2EI dx$ b)
 - c) $\int M^2 / 3EI dx$ $\int M^3 / 2EI dx$ d)

Max. Marks: 70

Marks: 14

Set | Q

7) Conjugate beam method or method of elastic weight is useful for the beam of

b)

non uniform EI

- a) uniform EI
- none of the above c) both a & b d)
- 8) Buckling of long column occurs under _
 - Axial load Transverse load a) b)
 - Direct load d) None c)
- The equivalent length is equal to half the actual length of a column with _____ 9)
 - a) One end fixed other end free
 - b) Both ends fixed
 - c) Both ends hinged
 - d) One end fixed other end hinged
- 10) The maximum shear stress on principal plane is .
 - a) Twice of minimum principal stress
 - b) Zero
 - c) Twice of maximum principal stress
 - d) One
- 11) Mohr's circle is graphical method to find _____.
 - a) Bending stresses
 - b) Buckling Stresses
 - Maximum Shear Stresses c)
 - d) None
- The equivalent Twisting moment under combined action of bending 12) moment M and Torque T is
 - a) $\sqrt{M^2 + T^2}$ b) b) $\frac{1}{2}\sqrt{M^2 - T^2}$ d) $\frac{1}{2}\left(M + \sqrt{M^2 + T^2}\right)$ d) c) $\frac{1}{2}M\sqrt{M^2 + T^2}$
- Every cross section of the shaft, which is subjected to a twisting moment 13) is under .
 - a) Compressive stress b)
 - c) Bending stress
- Tensile stress
- d) Shear stress
- 14) Maximum principal stress theory was postulated by _____
 - a) Rankine St. Venant b) c) Mohr Tresca
 - d)

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 1) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

Section – I

- Q.2 State the assumptions in Euler's Theory. Derive the formula for crippling load in case of long column having both the ends hinged.
- **Q.3 a)** Define Principal stresses and Principal Plane.
 - b) Two wooden pieces 10 cm x 10 cm in cross section are glued together along line BC as shown in figure 1 what axial force "P" can be applied if the allowable shearing stress along BC is 1.4 N/mm².

30°

figure 1(Q.no.3)

P



A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and

- Q.5 Determine the diameter of a bolt which is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN using
 - a) Maximum principal stress theory.
 - **b)** Maximum principal strain theory.

Given the Elastic limit in tension is 225 N/mm², factor of safety is 3 and Poisson's ratio is 0.3

Section – II

Q.6 a) What is deflection of beam?

Q.4

b) A steel girder of uniform cross section, 14 meters long is simply supported at its ends. It carries Concentrated loads as shown in figure find deflection under point loads A and B.

Use Macaulay's method. Take E =210 x 10^{6} KN/m²,I = 64 x 10^{-4} m⁴



Max. Marks: 56

02

09

09

Set Q

Q.7 A beam of span 10 m carries concentrated load of 20 KN at mid span. Find the central deflection. Use strain energy method (first theorem of Castigliano). Assume uniform flexural rigidity EI.



- **Q.8 a)** Castigliano's first theorem.
 - b) A three hinged parabolic arch of span 20 meters and central rise of 5 meters carries a point load of 200 KN at 6 meters from the left hand support as shown in figure. Find horizontal thrust and support reactions at A and B.



Q.9 Two wheel loads 80 KN and 200 KN, spaced 2m apart move on a girder of span 09 16 m. Find maximum bending moment at a section 6 m from the left end. Use influence line method. Any load can lead the other.



S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

STRUCTURAL MECHANICS – II

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - The equivalent Twisting moment under combined action of bending 1) moment M and Torque T is
 - a) $\sqrt{M^2 + T^2}$ b) $\frac{\frac{1}{2}}{\frac{1}{2}}\sqrt{M^2 - T^2} \\ \frac{1}{2}\left(M + \sqrt{M^2 + T^2}\right)$ d) c) $\frac{1}{2}M\sqrt{M^2+T^2}$
 - 2) Every cross section of the shaft, which is subjected to a twisting moment is under

b)

- a) Compressive stress
 - c) Bending stress d)
- 3) Maximum principal stress theory was postulated by _
 - Rankine a) b) c) Mohr d)
- 4) The simply supported beam of span 1, is carrying point load W at mid
 - span. What is the deflection at centre of the beam? a) $Wl^2 / 48 EI$ $Wl^3/48 EI$ b) c) $5Wl^3/348 EI$ d) 11 Wl³ 120 EI
- The simply supported beam of span 1, is carrying uniformly distributed 5) load of w per unit run over the whole span. What is the maximum deflection of the beam?
 - Wl³/30 EI Wl⁴/48 EI b) a) $5Wl^4$ Wl⁴/384 EI d) c) 384EI
- 6) Maximum bending moment due to moving load on simply supported beam occurs
 - a) At the mid span b) at the supports
 - under the load d) anywhere on the beam c)

SLR-FM-17



Max. Marks: 70

Marks: 14

- Tresca
- Tensile stress Shear stress
- St. Venant

				Set R
7)	Cas a) c)	stigliano's theorem is valid for any structure linear structure	b) d)	nonlinear structure any of the above
8)	A c she for	urve or graph that represents a fure ear force at the section, the bendin various positions of unit load of the	inction ng mo ne spa	n like, reaction at supports, the oment at a section of structure etc, an of the structure is called
	a) c)	influence line diagram shear stress diagram	b) d)	radial stress diagram None of these
9)	The bea a) c)	be beam subjected to bending, amount $\int M^2 / 2EI dx$ $\int M^2 / 3EI dx$	ount c b) d)	of strain energy stored in the $\int M^2 / EI dx$ $\int M^3 / 2EI dx$
10)	Cor bea a) c)	njugate beam method or method im of uniform EI both a & b	of ela b) d)	stic weight is useful for the non uniform EI none of the above
11)	Buc a) c)	ckling of long column occurs unde Axial load Direct load	er b) d)	Transverse load None
12)	The a) b) c) d)	e equivalent length is equal to hal One end fixed other end free Both ends fixed Both ends hinged One end fixed other end hinged	f the a	actual length of a column with
13)	The	e maximum shear stress on princi	pal pl	ane is

- a) Twice of minimum principal stress
- b) Zero
- c) Twice of maximum principal stress
- d) One

14) Mohr's circle is graphical method to find _____.

- a) Bending stresses
- b) Buckling Stresses
- c) Maximum Shear Stresses
- d) None

SLR-FM-17

Seat No.

Q.4

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 1) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

Section – I

- Q.2 State the assumptions in Euler's Theory. Derive the formula for crippling load in 10 case of long column having both the ends hinged.
- Q.3 Define Principal stresses and Principal Plane. a)
 - Two wooden pieces 10 cm x 10 cm in cross section are glued together b) along line BC as shown in figure 1 what axial force "P" can be applied if the allowable shearing stress along BC is 1.4 N/mm^2 .

at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if, The maximum direct stress is not to exceed 100 N/mm². a) The maximum shear stress is not to exceed 50 N/mm². b)

A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and

Q.5 Determine the diameter of a bolt which is subjected to an axial pull of 9 kN 09 together with a transverse shear force of 4.5 kN using

- Maximum principal stress theory. a)
- Maximum principal strain theory. b)

Given the Elastic limit in tension is 225 N/mm², factor of safety is 3 and Poisson's ratio is 0.3

Section – II

- What is deflection of beam? Q.6 a)
 - A steel girder of uniform cross section, 14 meters long is simply supported 07 b) at its ends. It carries Concentrated loads as shown in figure find deflection under point loads A and B.

Use Macaulay's method. Take E =210 x 10^{6} KN/m²,I = 64 x 10^{-4} m⁴







Max. Marks: 56

SLR-FM-17

09

02 07

Set R

Q.7 A beam of span 10 m carries concentrated load of 20 KN at mid span. Find the central deflection. Use strain energy method (first theorem of Castigliano). Assume uniform flexural rigidity EI.



- **Q.8 a)** Castigliano's first theorem.
 - A three hinged parabolic arch of span 20 meters and central rise of 5 meters carries a point load of 200 KN at 6 meters from the left hand support as shown in figure. Find horizontal thrust and support reactions at A and B.



Q.9 Two wheel loads 80 KN and 200 KN, spaced 2m apart move on a girder of span 09 16 m. Find maximum bending moment at a section 6 m from the left end. Use influence line method. Any load can lead the other.



S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - Maximum bending moment due to moving load on simply supported beam occurs _____.
 - a) At the mid span b) at the supports
 - c) under the load d) anywhere on the beam

2) Castigliano's theorem is valid for _____.a) any structure b) nonlinear structure

- a) any structureb) nonlinear structurec) linear structured) any of the above
- 3) A curve or graph that represents a function like, reaction at supports, the shear force at the section, the bending moment at a section of structure etc, for various positions of unit load of the span of the structure is called _____.
 - a) influence line diagram b) radial stress diagram
 - c) shear stress diagram d) None of these
- The beam subjected to bending, amount of strain energy stored in the beam _____.
 - a) $\int M^2 / 2EI \, dx$ b) $\int M^2 / EI \, dx$
 - c) $\int M^2 / 3EI \, dx$ d) $\int M^3 / 2EI \, dx$
- 5) Conjugate beam method or method of elastic weight is useful for the beam of _____.
 - a) uniform El b) non uniform El
 - c) both a & b d) none of the above
- 6) Buckling of long column occurs under _____.
 - a) Axial load b) Transverse load
 - c) Direct load d) None
- 7) The equivalent length is equal to half the actual length of a column with _____
 - a) One end fixed other end free
 - b) Both ends fixed
 - c) Both ends hinged
 - d) One end fixed other end hinged

9

Max. Marks: 70

Marks: 14

14



Seat No.

Set S

- 8) The maximum shear stress on principal plane is _____.
 - a) Twice of minimum principal stress
 - b) Zero
 - c) Twice of maximum principal stress
 - d) One
- 9) Mohr's circle is graphical method to find _____.
 - a) Bending stresses
 - b) Buckling Stresses
 - c) Maximum Shear Stresses
 - d) None
- 10) The equivalent Twisting moment under combined action of bending moment M and Torque T is _____.
 - a) $\sqrt{M^2 + T^2}$ b) $\frac{1}{2}\sqrt{M^2 - T^2}$ c) $\frac{1}{2}M\sqrt{M^2 + T^2}$ d) $\frac{1}{2}(M + \sqrt{M^2 + T^2})$
- 11) Every cross section of the shaft, which is subjected to a twisting moment is under _____.
 - a) Compressive stress b) Tensile stress
 - c) Bending stress d) Shear stress
- 12) Maximum principal stress theory was postulated by _____
 - a) Rankine b) St. Venant c) Mohr d) Tresca
- 13) The simply supported beam of span 1, is carrying point load W at mid span. What is the deflection at centre of the beam?
 - a) $Wl^2 / 48 EI$ b) $Wl^3 / 48 EI$
 - c) $5Wl^3/348 EI$
- d) $\frac{11}{120} \frac{Wl^3}{El}$
- 14) The simply supported beam of span 1, is carrying uniformly distributed load of w per unit run over the whole span. What is the maximum deflection of the beam?
 - a) Wl⁴/48 EI
 - c) $\frac{5Wl^4}{384EI}$

- b) Wl³/30 EI
- d) Wl⁴/384 EI

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 1) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

Section – I

- Q.2 State the assumptions in Euler's Theory. Derive the formula for crippling load in case of long column having both the ends hinged.
- **Q.3 a)** Define Principal stresses and Principal Plane.
 - b) Two wooden pieces 10 cm x 10 cm in cross section are glued together along line BC as shown in figure 1 what axial force "P" can be applied if the allowable shearing stress along BC is 1.4 N/mm².

30°

figure 1(Q.no.3)

P



A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and

Q.5 Determine the diameter of a bolt which is subjected to an axial pull of 9 kN together with a transverse shear force of 4.5 kN using

- a) Maximum principal stress theory.
- **b)** Maximum principal strain theory.

Given the Elastic limit in tension is 225 N/mm², factor of safety is 3 and Poisson's ratio is 0.3

Section – II

Q.6 a) What is deflection of beam?

Q.4

b) A steel girder of uniform cross section, 14 meters long is simply supported at its ends. It carries Concentrated loads as shown in figure find deflection under point loads A and B.

Use Macaulay's method. Take E =210 x 10^6 KN/m²,I = 64 x 10^{-4} m⁴



Max. Marks: 56

02

09

09

Set S

Q.7 A beam of span 10 m carries concentrated load of 20 KN at mid span. Find the central deflection. Use strain energy method (first theorem of Castigliano). Assume uniform flexural rigidity EI.



- **Q.8 a)** Castigliano's first theorem.
 - A three hinged parabolic arch of span 20 meters and central rise of 5 meters carries a point load of 200 KN at 6 meters from the left hand support as shown in figure. Find horizontal thrust and support reactions at A and B.



Q.9 Two wheel loads 80 KN and 200 KN, spaced 2m apart move on a girder of span09 16 m. Find maximum bending moment at a section 6 m from the left end. Use influence line method. Any load can lead the other.



Set

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 1) What will be the length of long chord for a simple circular curve of R radius and deflection angle of D⁰?

a) $(R^*D^*\pi)/180$

- b) $2R^*sin(D/2)$ d) None of these
- c) Rtan(D/2)
- 2) Parabola is preferred as vertical curve because____
 - a) the rate of change in slope of a parabola is constant
 - b) the rate of change in slope of a parabola is variable
 - c) It is easier to set on field
 - d) Its length is minimum

3) Civil signal which provides least accurate position is _____.

- a) C/A b) L1 c) L2C d) L5
- 4) Principle of GPS positioning is _____
 - a) Intersection b) Analytical Resection
 - c) Radiation d) Resection
- 5) Any GPS positioning requires processing of at least _
 - C/A code b) L1 with C/A code
 - c) L2C d) L5
- 6) Estimation of three components of a vector between the reference and rover stations is known as _____.
 - a) Baseline Solution b) Ranging
 - c) GPS Positioning d) GPS timing.
- 7) A and B are two towers of equal height diametrically opposite on either side of the nadir point, at 3 km and 5 km distances. Which one of the following statements is correct?
 - a) Height displacement of A will be less than that of B
 - b) Height displacement of B will be less than that of A
 - c) Height displacement of A and B is equal
 - d) Height displacement of A and B will be towards each other
- 8) Which form of scattering in the atmosphere is NOT dependent on wavelength?
 - a) Rayleigh
 - c) Mie

- b) Non-Selective
- d) Both Rayleigh and Mie



Max. Marks: 70

Marks: 14

- 9) Global Positioning Service (GPS) uses 24 satellites in _____.
 - 9 Orbits a)

C)

C)

b) 8 Orbits

- 7 Orbits 6 Orbits d)
- 10) Three basic kinds of vector entities are
 - Point, Raster, Attributes a) Point, Line/Polyline, Polygon
- Image, Raster, Polygon b)

SLR-FM-18

Set | P

d) Polyline, Polygon, Raster

Deduction

- Which of the following are true? 11)
 - Digitizing is defined as converting aerial photographs into maps a)
 - A keyboard cannot be used to digitize maps, only to enter attribute b) information
 - C) Digitizing from a tablet involves using a template.
 - Digitizing involves tracing map features into a computer d)
 - Polygons showing the area occupied by a particular land use or e) variable.
- 12) How many attributes, vector data unit can have?
 - 2 1 b) a)
 - c) d) Infinite 3
- 13) 10 m spatial resolution is _____ over 20 m spatial resolution data.
 - Better Inferior b) a)
 - No change d) Lesser C)
- 14) Buffering technique results in area b)
 - Reduction a)
 - C) Expansion d) No change

03

Seat No.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Instructions: 1) Assume suitable data wherever necessary but mention it clearly.

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

		2) Q. no. 3) Solve 4) Solve	2 and Q.no.6 is com any two questions ou any two questions ou	pulsory. It of Q. no. 3, 4 & 5. It of Q. no. 7, 8 & 9.	, , , , , , , , , , , , , , , , , , ,			
			Sec	tion - I				
Q.2	a)	Calculate the data for setting the simple circular curve between two straights AB and BC having a deflection angle of $25^{0}15^{\circ}$. Assume radius of curve as 150m and peg interval as 20m. Chainage of B (point of intersection) = 1522m. Assume least count of theodolite = 10". Use Rankines method of deflection angles						
	b)	A 180-meter equal tangent parabolic vertical curve is to be placed to negotiate a upward grade of 1.50% followed by a downward grade at 2.5% intersecting at a station having elevation 185.795 m above mean sea level. Calculate elevations at every 30 m stations on the vertical curve and determine the station and elevation of the highest point on the vertical curve						
Q.3	a)	What are the various methods of calculating the length of transition curve?						
	b) c)	Explain any one method. Explain the architecture of GPS system along with a line diagram. Explain with figure the method for absolute positioning of GPS control point.						
Q.4	a) b)	Explain in de Write a note	etail the contents of G on navigation data. I	GPS signal. How navigation data i	s useful for GPS	03 03		
	c)	Name and explain the different surfaces of the earth along with a diagram. 03 Define the following terms along with their significance in surveying:						
Q.5	a)	A vertical photo was taken with a 150.00 mm focal length camera at a flying height of 1400 m above the datum. The following were the results;				06		
		Point	X	у	Elevation			
		а	-52.35 mm	-48.27 mm	204 m			
		b	40.64 mm	43.88 mm	148 m			

From the ground coordinates of the points a and b, determine the horizontal length of AB.

b) The relief displacement for a tower is 2.01 mm, and the radial distance from the center of the photo to the top of the tower is 56.43mm. If the flying height is 1220m above the base of the tower, find the height of the tower.

Max. Marks: 56

SLR-FM-18

Set P

SLR-FM-18 Set P

Section – II

Q.6	a)	State and explain spatial and non-spatial Information.	04
	b)	Explain any one GIS software with tool boxes available in it.	04
	c)	What are the advantages of GIS?	04
Q.7	a)	Differentiate between digitizer and scanners.	04
	b)	Explain preprocessing of GIS data set.	04
Q.8	Exp a) b)	lain the Project Survey for Highway Tunnel	08
Q.9	Exp a) b)	lain the Project Survey for Mine Building	08

Civil Engineering SURVEYING - II Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book. 2) Figures to the right indicate full marks. **MCQ/Objective Type Questions Duration: 30 Minutes** Q.1 Choose the correct alternatives from the options and rewrite the sentence. Which form of scattering in the atmosphere is NOT dependent on wavelength? Rayleigh Non-Selective a) b) c) Mie d) Both Rayleigh and Mie Global Positioning Service (GPS) uses 24 satellites in _____. a) 9 Orbits b) 8 Orbits 7 Orbits d) 6 Orbits C) Three basic kinds of vector entities are

Point, Line/Polyline, Polygon c) Which of the following are true? 4)

Point, Raster, Attributes

- Digitizing is defined as converting aerial photographs into maps a)
- b) A keyboard cannot be used to digitize maps, only to enter attribute information

b)

d)

Image, Raster, Polygon

Polyline, Polygon, Raster

- Digitizing from a tablet involves using a template. c)
- Digitizing involves tracing map features into a computer d)
- Polygons showing the area occupied by a particular land use or e) variable.

5) How many attributes, vector data unit can have?

- 1 a) b) 2
- 3 Infinite c) d)
- 10 m spatial resolution is _____ over 20 m spatial resolution data. 6)
 - a) Better b) Inferior
 - c) No change d) Lesser
- Buffering technique results in area 7)
 - Reduction b) Deduction a)
 - C) Expansion d) No change
- What will be the length of long chord for a simple circular curve of R radius 8) and deflection angle of D^{0} ?
 - $(R^*D^*\pi)/180$ b) $2R^*sin(D/2)$
 - C) Rtan(D / 2)d) None of these

Seat No.

1)

2)

3)

a)

a)



Max. Marks: 70

SLR-FM-18

Marks: 14

					Set
9)	Para a) b) c) d)	abola is preferred as vertical curve the rate of change in slope of a the rate of change in slope of a the rate of change in slope of a It is easier to set on field Its length is minimum	e beca barabo barabo	nuse ola is constant ola is variable	
10)	Civil a) c)	signal which provides least accur C/A L2C	rate po b) d)	osition is L1 L5	
11)	Prino a) c)	ciple of GPS positioning is Intersection Radiation	b) d)	Analytical Resection Resection	
12)	Any a) c)	GPS positioning requires process C/A code L2C	sing of b) d)	f at least L1 with C/A code L5	
13)	Estir rove a) c)	mation of three components of a v r stations is known as Baseline Solution GPS Positioning	vector b) d)	between the reference and Ranging GPS timing.	1

- 14) A and B are two towers of equal height diametrically opposite on either side of the nadir point, at 3 km and 5 km distances. Which one of the following statements is correct?
 - a) Height displacement of A will be less than that of B
 - b) Height displacement of B will be less than that of A
 - c) Height displacement of A and B is equal
 - d) Height displacement of A and B will be towards each other

Q

03

Seat No.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - II

Instructions: 1) Assume suitable data wherever necessary but mention it clearly.

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

		2) Q. no. 3) Solve 4) Solve	2 and Q.no.6 is com any two questions ou any two questions ou	pulsory. It of Q. no. 3, 4 & 5. It of Q. no. 7, 8 & 9.	,			
			Sec	tion - I				
Q.2	a)	Calculate the data for setting the simple circular curve between two straights AB and BC having a deflection angle of $25^{0}15$. Assume radius of curve as 150m and peg interval as 20m. Chainage of B (point of intersection) = 1522m. Assume least count of theodolite = 10". Use						
	b)	A 180-meter equal tangent parabolic vertical curve is to be placed to negotiate a upward grade of 1.50% followed by a downward grade at 2.5% intersecting at a station having elevation 185.795 m above mean sea level. Calculate elevations at every 30 m stations on the vertical curve and determine the station and elevation of the highest point on the vertical						
Q.3	a)	What are the	various methods of	calculating the length	n of transition curve?	03		
	b) c)	Explain any one method.03Explain the architecture of GPS system along with a line diagram.03Explain with figure the method for absolute positioning of GPS control03point.03						
Q.4	a) b)	Explain in detail the contents of GPS signal.03Write a note on navigation data. How navigation data is useful for GPS03						
	c)	Name and explain the different surfaces of the earth along with a diagram. 03 Define the following terms along with their significance in surveying:						
Q.5	a)	ellipsoidal height, Orthometric height and Geoid height. A vertical photo was taken with a 150.00 mm focal length camera at a 06 flying height of 1400 m above the datum. The following were the results;						
		Point	X	у	Elevation			
		а	-52.35 mm	-48.27 mm	204 m			
		b	40.64 mm	43.88 mm	148 m			

From the ground coordinates of the points a and b, determine the horizontal length of AB.

The relief displacement for a tower is 2.01 mm, and the radial distance b) from the center of the photo to the top of the tower is 56.43mm. If the flying height is 1220m above the base of the tower, find the height of the tower.

Max. Marks: 56

SLR-FM-18



Q

SLR-FM-18 Set Q

Section – II

Q.6	a)	State and explain spatial and non-spatial Information.	04
	b)	Explain any one GIS software with tool boxes available in it.	04
	c)	What are the advantages of GIS?	04
Q.7	a)	Differentiate between digitizer and scanners.	04
	b)	Explain preprocessing of GIS data set.	04
Q.8	Exp a) b)	lain the Project Survey for Highway Tunnel	08
Q.9	Exp a) b)	lain the Project Survey for Mine Building	08

SLR-FM-18 Set

Seat No.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - II

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

7)

Choose the correct alternatives from the options and rewrite the sentence. Q.1

- 1) Any GPS positioning requires processing of at least
 - L1 with C/A code C/A code b) a) L₂C L5 c) d)
- 2) Estimation of three components of a vector between the reference and rover stations is known as
 - a) **Baseline Solution** b) Ranging
 - c) **GPS** Positioning d) GPS timing.
- 3) A and B are two towers of equal height diametrically opposite on either side of the nadir point, at 3 km and 5 km distances. Which one of the following statements is correct?
 - Height displacement of A will be less than that of B a)
 - Height displacement of B will be less than that of A b)
 - Height displacement of A and B is equal c)
 - Height displacement of A and B will be towards each other d)
- Which form of scattering in the atmosphere is NOT dependent on 4) wavelength?
 - Rayleigh a)
 - c) Mie d) Both Rayleigh and Mie
- Global Positioning Service (GPS) uses 24 satellites in _____. 5)
 - a) 9 Orbits b) 8 Orbits
 - 7 Orbits 6 Orbits C) d)

Three basic kinds of vector entities are _ 6) b)

- Point, Raster, Attributes a)
- Point, Line/Polyline, Polygon c)
- Which of the following are true?

d)

b)

Non-Selective

Image, Raster, Polygon

Polyline, Polygon, Raster

- Digitizing is defined as converting aerial photographs into maps a)
- b) A keyboard cannot be used to digitize maps, only to enter attribute information
- Digitizing from a tablet involves using a template. c)
- Digitizing involves tracing map features into a computer d)
- Polygons showing the area occupied by a particular land use or e) variable.

Max. Marks: 70

Marks: 14

14

R

8) How many attributes, vector data unit can have?

- a) 1 b) 2
- Infinite c) 3 d)
- 10 m spatial resolution is _____ over 20 m spatial resolution data. 9)
 - Better b) Inferior a)
 - C) No change d) Lesser

Buffering technique results in area ____ 10)

- b) Deduction a) Reduction
- C) Expansion d) No change
- 11) What will be the length of long chord for a simple circular curve of R radius and deflection angle of D^{0} ?
 - $(R^*D^*\pi)/180$ b) a) $2R^*sin(D/2)$
 - c) Rtan(D / 2)d) None of these
- 12) Parabola is preferred as vertical curve because_
 - the rate of change in slope of a parabola is constant a)
 - the rate of change in slope of a parabola is variable b)
 - It is easier to set on field C)
 - Its length is minimum d)

13) Civil signal which provides least accurate position is _____.

- C/A b) L1 a)
- L5 L2C d) C)

Principle of GPS positioning is _____. 14) Intersection

a)

- b) Analytical Resection
- Radiation d) Resection C)

SLR-FM-18 Set | R

03

Seat No.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instru	 Instructions: 1) Assume suitable data wherever necessary but mention it clearly. 2) Q. no. 2 and Q.no.6 is compulsory. 3) Solve any two questions out of Q. no. 3, 4 & 5. 4) Solve any two questions out of Q. no. 7, 8 & 9. 								
			Sec	tion - I					
Q.2	a)	Calculate the straights AB curve as 150 intersection) Rankines me	Calculate the data for setting the simple circular curve between two straights AB and BC having a deflection angle of $25^{0}15^{\circ}$. Assume radius of curve as 150m and peg interval as 20m. Chainage of B (point of intersection) = 1522m. Assume least count of theodolite = 10". Use Rankines method of deflection angles						
	b)	A 180-meter negotiate a u 2.5% interse sea level. Ca and determin curve.	A 180-meter equal tangent parabolic vertical curve is to be placed to negotiate a upward grade of 1.50% followed by a downward grade at 2.5% intersecting at a station having elevation 185.795 m above mean sea level. Calculate elevations at every 30 m stations on the vertical curve and determine the station and elevation of the highest point on the vertical						
Q.3	a)	What are the	various methods of	calculating the length	of transition curve?	03			
	b) c)	Explain any of Explain the a Explain with point.	one method. architecture of GPS s figure the method for	ystem along with a lir r absolute positioning	ne diagram. of GPS control	03 03			
Q.4	a)	Explain in de	etail the contents of G	PS signal.		03			
	D)	surveying?	on navigation data. I	How navigation data is	s useful for GPS	03			
	c)	Name and ex Define the for ellipsoidal he	Name and explain the different surfaces of the earth along with a diagram. 03 Define the following terms along with their significance in surveying:						
Q.5	a)	A vertical photogram of the second se	oto was taken with a of 1400 m above the	150.00 mm focal leng datum. The following	gth camera at a were the results;	06			
		Point	X	У	Elevation				
		а	-52.35 mm	-48.27 mm	204 m				
		b	40.64 mm	43.88 mm	148 m				

From the ground coordinates of the points a and b, determine the horizontal length of AB.

b) The relief displacement for a tower is 2.01 mm, and the radial distance from the center of the photo to the top of the tower is 56.43mm. If the flying height is 1220m above the base of the tower, find the height of the tower.

Max. Marks: 56

SLR-FM-18

Set

R

SLR-FM-18 Set R

Section – II

Q.6	a)	State and explain spatial and non-spatial Information.	04
	b)	Explain any one GIS software with tool boxes available in it.	04
	c)	What are the advantages of GIS?	04
Q.7	a)	Differentiate between digitizer and scanners.	04
	b)	Explain preprocessing of GIS data set.	04
Q.8	Exp a) b)	plain the Project Survey for Highway Tunnel	08
Q.9	Exp a) b)	plain the Project Survey for Mine Building	08

Seat No.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - II

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 1)

- Three basic kinds of vector entities are
- Point, Raster, Attributes b) Image, Raster, Polygon a) Point, Line/Polyline, Polygon Polyline, Polygon, Raster c) d)
- 2) Which of the following are true?
 - Digitizing is defined as converting aerial photographs into maps a)
 - b) A keyboard cannot be used to digitize maps, only to enter attribute information
 - Digitizing from a tablet involves using a template. c)
 - d) Digitizing involves tracing map features into a computer
 - Polygons showing the area occupied by a particular land use or e) variable.
- 3) How many attributes, vector data unit can have?
 - 1 a) b) 2
 - c) 3 d) Infinite
- 10 m spatial resolution is _____ over 20 m spatial resolution data. 4)
 - Better b) Inferior a)
 - No change Lesser c) d)

5) Buffering technique results in area _____

- Reduction b) Deduction a)
- Expansion d) No change c)
- What will be the length of long chord for a simple circular curve of R radius 6) and deflection angle of D^{0} ?
 - $(R^*D^*\pi)/180$ a) C)
 - b) $2R^*sin(D/2)$ Rtan(D/2)None of these d)
- 7) Parabola is preferred as vertical curve because
 - the rate of change in slope of a parabola is constant a)
 - b) the rate of change in slope of a parabola is variable
 - It is easier to set on field C)
 - Its length is minimum d)

Civil signal which provides least accurate position is _____. 8)

a)	C/A	b)	L1
c)	L2C	d)	L5



Max. Marks: 70

Marks: 14

9) Principle of GPS positioning is ____

C/A code

a) C)

- a) Intersection C) Radiation
- b) Analytical Resection

SLR-FM-18

Set S

- Resection d)
- Any GPS positioning requires processing of at least _ 10)
 - L1 with C/A code b)
 - L2C
- d) L5
- Estimation of three components of a vector between the reference and 11) rover stations is known as
 - **Baseline Solution** b) Ranging a)
 - GPS timing. C) **GPS** Positioning d)
- A and B are two towers of equal height diametrically opposite on either 12) side of the nadir point, at 3 km and 5 km distances. Which one of the following statements is correct?
 - a) Height displacement of A will be less than that of B
 - Height displacement of B will be less than that of A b)
 - Height displacement of A and B is equal c)
 - Height displacement of A and B will be towards each other d)
- Which form of scattering in the atmosphere is NOT dependent on 13) wavelength?
 - Rayleigh a) Mie

- b) Non-Selective
- d) Both Rayleigh and Mie
- 14) Global Positioning Service (GPS) uses 24 satellites in _____.
 - 9 Orbits a) 7 Orbits c)

c)

8 Orbits b)

6 Orbits

d)

Page 14 of 16

03

Seat No. S.E. (Part - II) ((

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Instructions: 1) Assume suitable data wherever necessary but mention it clearly.

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

		2) Q. no. 3) Solve 4) Solve	2 and Q.no.6 is com any two questions ou any two questions ou	pulsory. It of Q. no. 3, 4 & 5. It of Q. no. 7, 8 & 9.	, , , , , , , , , , , , , , , , , , ,				
			Sec	tion - I					
Q.2	a)	Calculate the data for setting the simple circular curve between two straights AB and BC having a deflection angle of $25^{0}15^{\circ}$. Assume radius of curve as 150m and peg interval as 20m. Chainage of B (point of intersection) = 1522m. Assume least count of theodolite = 10". Use Rankines method of deflection angles.							
	b)	A 180-meter negotiate a u 2.5% interse sea level. Ca and determin curve.	equal tangent parab upward grade of 1.50 cting at a station hav alculate elevations at ne the station and ele	olic vertical curve is to % followed by a down ing elevation 185.795 every 30 m stations of evation of the highest	o be placed to hward grade at 5 m above mean on the vertical curve point on the vertical	05			
Q.3	a)	What are the various methods of calculating the length of transition curve? 0							
	 Explain any one method. b) Explain the architecture of GPS system along with a line diagram. c) Explain with figure the method for absolute positioning of GPS control point. 								
Q.4	a) b)	Explain in detail the contents of GPS signal. Write a note on navigation data. How navigation data is useful for GPS							
 c) Name and explain the different surfaces of the earth along with a dia Define the following terms along with their significance in surveying: ellipsoidal beight. Orthometric beight and Geoid beight 									
Q.5	Q.5 a) A vertical photo was taken with a 150.00 mm focal length camera at a flying height of 1400 m above the datum. The following were the results								
		Point	X	У	Elevation				
		а	-52.35 mm	-48.27 mm	204 m				
		b	40.64 mm	43.88 mm	148 m				

From the ground coordinates of the points a and b, determine the horizontal length of AB.

b) The relief displacement for a tower is 2.01 mm, and the radial distance from the center of the photo to the top of the tower is 56.43mm. If the flying height is 1220m above the base of the tower, find the height of the tower.

Max. Marks: 56

SLR-FM-18

Set

S

Set S

Section – II

Q.6	a)	State and explain spatial and non-spatial Information.	04			
	b)	Explain any one GIS software with tool boxes available in it.	04			
	c)	What are the advantages of GIS?	04			
Q.7	a)	Differentiate between digitizer and scanners.	04			
	b)	Explain preprocessing of GIS data set.	04			
Q.8	Exp a) b)	lain the Project Survey for Highway Tunnel	08			
Q.9	Explain the Project Survey for a) Mine b) Building					

07

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019

Civil Engineering BUILDING PLANNING AND DESIGN

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Seat

No.

			Boo	k				
		2)	Figu	ures to the right indicate ful	l marks.			
		3)	Ass	ume suitable data whereve	er necessa	ary and mention it clearly	/.	
		4)	Ret	ain all projection/construction	on lines o	n drawing sheet.		
				MCQ/Objective T	ype Qu	estions		
Dura	ition: 3	0 Min	utes	•			Marks: 14	
Q.1	A)	Choose the correct alternatives from the options and rewrite the					07	
		sente	entence.					
		1)	For kitchen cum dining room the minimum area should be					
		-	a)	5 sq. m	b)	9.5 sq. m		
			c)	6 sq. m	d)	15 sq. m		
		2)	Whi	h of the following does not affect FAR.?				
			a)	Type of construction	b)	Locality of density		
			c)	Colour of building	d)	Parking facilities		

For built-up area calculations _____ is drawn on the building 3) permission drawing.

- Terrace plan Plan a) b)
- Site plan d) Block plan C)
- The minimum heights for bath-rooms or water closets as specified by 4) NBC of India are _____.
 - a) 2.4 m. b) 3.2 m.
 - 2.2 m. d) 2.6 m. C)

5) For Bedroom Aspect it needs at

Remains same

- b) E-aspect. S-aspect a)
- SW-aspect. W-aspect d) C)

If object is on picture plane, then the size perspective will be _____. 6) a) Enlarged

- Reduced b)
- d) All of the above
- Which of the followings is a component of aesthetic? 7)
 - a) Brightness b) Uniqueness
 - Balance None of these C) d)

Q.1 B) Fill in the blanks.

C)

- In perspective drawing, H.P means _____. 1)
- Minimum area of habitable room is _____. 2)
- For better roominess the desirable ratio of length to breadth of room is ____. 3)
- Dressing table is furniture which is to be provided in _____. 4)
- In bank building, the area of waiting hall depends on 5)
- For good acoustical considerations, the reverberation time should not 6) be more than
- The unit of fire load is _____. 7)

Max. Marks: 70

Set

SLR-FM-19



10

08

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING AND DESIGN

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Seat No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

- 3) Section I to be written in answer book.
- Section II to be drawn on FULL imperial drawing sheet. Use both sides of the sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Retain all projection/construction lines on drawing sheet.

Section – I

Q.2 Write the answers for followings. (Any FOUR)

- a) What do you building bye-laws? What are its objectives? Discuss any two building bye-laws in brief.
- **b)** Write the procedure of building permission? Also discuss documents required for building permission.
- c) State various defects in acoustics? Explain in brief.
- d) How do you classify noises? Explain the modes of transmission of these noises?
- e) What do you mean by fire resisting buildings? Also explain fire safety measures?
- f) Write a note on:
 - 1) Low-cost housing
 - 2) Green building
- **g)** Write a note on:
 - 1) Scope of architecture
 - 2) Interior design of residential building

Section – II

- **Q.3** Design and Draw to scale of 1:50 a bungalow for a Civil Engineer. Provide for the following areas/rooms.
 - a) A living room
 - **b)** A Kitchen
 - c) Two Bed room
 - d) Toilet block
 - e) Staircase
 - f) Consulting Room
 - 1) Draw typical plan, 1:50 & show all details.
 - Draw sectional elevation for above mentioned plan, scale 1:50 & show 10 all details.
- **Q.4** Draw perspective view of the following object, consider following data:
 - a) Use scale 1:100
 - **b)** Symbols have usual meaning
 - c) Preserve all ray lines

Max. Marks: 56

SLR-FM-19

l





S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

BUILDING PLANNING AND DESIGN

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Book 2) Figures to the right indicate full marks. 3) Assume suitable data wherever necessary and mention it clearly. 4) Retain all projection/construction lines on drawing sheet. **MCQ/Objective Type Questions Duration: 30 Minutes** Marks: 14 Q.1 A) Choose the correct alternatives from the options and rewrite the 07 sentence. For Bedroom Aspect it needs at 1) b) S-aspect E-aspect. a) SW-aspect. d) W-aspect C) 2) If object is on picture plane, then the size perspective will be _____. Enlarged b) Reduced a) All of the above Remains same C) d) 3) Which of the followings is a component of aesthetic? Brightness b) Uniqueness a) C) Balance d) None of these 4) For kitchen cum dining room the minimum area should be _____. 5 sq. m 9.5 sq. m a) b) 6 sq. m d) 15 sq. m C) 5) Which of the following does not affect FAR.? Type of construction Locality of density b) a) Colour of building d) Parking facilities C) For built-up area calculations _____ is drawn on the building 6) permission drawing. Terrace plan a) b) Plan Site plan C) d) Block plan The minimum heights for bath-rooms or water closets as specified by 7) NBC of India are _____. 2.4 m. a) b) 3.2 m. 2.2 m. C) d) 2.6 m. 07 Q.1 B) Fill in the blanks. In bank building, the area of waiting hall depends on _____ 1) For good acoustical considerations, the reverberation time should not 2) be more than The unit of fire load is _____ 3) In perspective drawing, H.P means _____. 4) Minimum area of habitable room is ____ 5) For better roominess the desirable ratio of length to breadth of room is ____. 6) Dressing table is furniture which is to be provided in _____ 7)

Max. Marks: 70

Set

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer

Seat

No.

10

08

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering BUILDING PLANNING AND DESIGN**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Seat No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

- 3) Section I to be written in answer book.
- 4) Section II to be drawn on FULL imperial drawing sheet. Use both sides of the sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Retain all projection/construction lines on drawing sheet.

Section – I

Q.2 Write the answers for followings. (Any FOUR)

- What do you building bye-laws? What are its objectives? Discuss any two a) building bye-laws in brief.
- Write the procedure of building permission? Also discuss documents b) required for building permission.
- State various defects in acoustics? Explain in brief. c)
- How do you classify noises? Explain the modes of transmission of these d) noises?
- e) What do you mean by fire resisting buildings? Also explain fire safety measures?
- Write a note on: **f**)
 - 1) Low-cost housing
 - 2) Green building
- Write a note on: g)
 - Scope of architecture 1)
 - Interior design of residential building 2)

Section – II

- Design and Draw to scale of 1:50 a bungalow for a Civil Engineer. Provide Q.3 for the following areas/rooms.
 - A living room a)
 - A Kitchen b)
 - Two Bed room c)
 - Toilet block d)
 - Staircase e)
 - Consulting Room **f**)
 - Draw typical plan, 1:50 & show all details. 1)
 - Draw sectional elevation for above mentioned plan, scale 1:50 & show 2) 10 all details.
- Draw perspective view of the following object, consider following data: Q.4
 - Use scale 1:100 a)
 - Symbols have usual meaning b)
 - Preserve all ray lines c)

Max. Marks: 56

SLR-FM-19





				MCQ/Objective	• Type Que	estions		
Dura	tion: 3	30 Mi	nutes	i –		Marks	s: 14	
Q.1	A)	Choose the correct alternatives from the options and rewrite the sentence.					07	
		1)	For peri a)	built-up area calculation mission drawing. Terrace plan Site plan	s is b) d)	drawn on the building Plan Block plan		
		2)	The NB(a)	minimum heights for ba C of India are 2.4 m.	th-rooms or v b)	3.2 m.		
		3)	c) For a)	2.2 m. Bedroom Aspect it need E-aspect. SW-aspect	d) s at b) d)	2.6 m. S-aspect W-aspect		
		4)	lf ot a) c)	oject is on picture plane, Enlarged Remains same	then the size b) d)	e perspective will be Reduced All of the above		
		5)	Whi a) c)	ich of the followings is a Brightness Balance	component c b) d)	of aesthetic? Uniqueness None of these		
		6)	For a) c)	kitchen cum dining room 5 sq. m 6 sq. m	າ the minimui b) d)	m area should be 9.5 sq. m 15 sq. m		
		7)	Whi a) c)	ich of the following does Type of construction Colour of building	not affect FA b) d)	R.? Locality of density Parking facilities		
Q.1	B)	Fill	in the	e blanks.			07	
	-	1) 2) 3) 4) 5)	For better roominess the desirable ratio of length to breadth of room is Dressing table is furniture which is to be provided in In bank building, the area of waiting hall depends on For good acoustical considerations, the reverberation time should not be more than The unit of fire load is					
		6)	in p	erspective arawing, H.P	means	·		

Minimum area of habitable room is _____.

7)

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever necessary and mention it clearly.
- 4) Retain all projection/construction lines on drawing sheet.

Time: 02:30 PM To 06:30 PM

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019

Book

Civil Engineering **BUILDING PLANNING AND DESIGN** Day & Date: Monday, 25-11-2019

SLR-FM-19

Set

Max. Marks: 70

R

Seat No.
10

08

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING AND DESIGN

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

- 3) Section I to be written in answer book.
- Section II to be drawn on FULL imperial drawing sheet. Use both sides of the sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Retain all projection/construction lines on drawing sheet.

Section – I

Q.2 Write the answers for followings. (Any FOUR)

- a) What do you building bye-laws? What are its objectives? Discuss any two building bye-laws in brief.
- **b)** Write the procedure of building permission? Also discuss documents required for building permission.
- c) State various defects in acoustics? Explain in brief.
- d) How do you classify noises? Explain the modes of transmission of these noises?
- e) What do you mean by fire resisting buildings? Also explain fire safety measures?
- f) Write a note on:
 - 1) Low-cost housing
 - 2) Green building
- **g)** Write a note on:
 - 1) Scope of architecture
 - 2) Interior design of residential building

Section – II

- **Q.3** Design and Draw to scale of 1:50 a bungalow for a Civil Engineer. Provide for the following areas/rooms.
 - a) A living room
 - **b)** A Kitchen
 - c) Two Bed room
 - d) Toilet block
 - e) Staircase
 - f) Consulting Room
 - 1) Draw typical plan, 1:50 & show all details.
 - Draw sectional elevation for above mentioned plan, scale 1:50 & show 10 all details.
- **Q.4** Draw perspective view of the following object, consider following data:
 - a) Use scale 1:100
 - b) Symbols have usual meaning
 - c) Preserve all ray lines

SLR-FM-19

Max. Marks: 56





Set S

Max. Marks: 70

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil** Engineering **BUILDING PLANNING AND DESIGN**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Seat

No.

mou	40110		Book			' -
		2) Figures to the right indicate full r	narks.		
		3) Assume suitable data wherever	necessa	ary and mention it clearly.	
		4) Retain all projection/constructior	n lines o	n drawing sheet.	
			MCQ/Objective Tv	ne Qu	estions	
Dura	tion: :	30 Mi	nutes		Mark	s: 14
01	۸١	Cho	as the correct alternatives fro	m tha a	ntions and rowrite the	07
Q. I	Α)	sen	tence.			07
		1)	If object is on picture plane, then	the size	e perspective will be	
		,	a) Enlarged	b)	Reduced	
			c) Remains same	d)	All of the above	
		2)	Which of the followings is a com	ponent	of aesthetic?	
			a) Brightness	b)	Uniqueness	
			c) Balance	d)	None of these	
		3)	For kitchen cum dining room the	minimu	Im area should be	
			a) 5 sq. m	b)	9.5 sq. m	
			c) 6 sq. m	d)	15 sq. m	
		4)	Which of the following does not a	affect F/	AR.?	
			a) Type of construction	b)	Locality of density	
		-	c) Colour of building	a) .	Parking facilities	
		5)	For built-up area calculations	!:	s drawn on the building	
			a) Terrace plan	b)	Plan	
			c) Site plan	(U	Block plan	
		\mathbf{c}	The minimum heights for both re	G)		
		6)	NBC of India are	oms or	water closets as specified by	
			a) 24 m	b)	3.2 m	
			c) 2.2 m.	d)	2.6 m.	
		7)	For Bodroom Aspect it poods at	- /		
		()	a) E-aspect	b)	 S-aspect	
			c) SW-aspect.	d)	W-aspect	
0.1	D)	C :11	in the blanks	ω)		07
Q.1	D)	FIII 1)	For good acoustical consideration	ns the	reverberation time should not	07
		''	be more than	/13, the		
		2)	The unit of fire load is			
		3)	In perspective drawing, H.P mea	ans		
		4)	Minimum area of habitable room	is		
		5)	For better roominess the desirab	le ratio	of length to breadth of room is	·
		6) 7)	Dressing table is furniture which	is to be	provided in	
		()	in bank building, the area of wait	ing hall	aepenas on	
						10 .

Instructions: 1) Q No. 1 is compulsory. It should be solved in first 30 minutes in Answer

10

08

SLR-FM-19

Seat No.

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING AND DESIGN

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Section I to be written in answer book.
- 4) Section II to be drawn on FULL imperial drawing sheet. Use both sides of the sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Retain all projection/construction lines on drawing sheet.

Section – I

Q.2 Write the answers for followings. (Any FOUR)

- a) What do you building bye-laws? What are its objectives? Discuss any two building bye-laws in brief.
- **b)** Write the procedure of building permission? Also discuss documents required for building permission.
- c) State various defects in acoustics? Explain in brief.
- **d)** How do you classify noises? Explain the modes of transmission of these noises?
- e) What do you mean by fire resisting buildings? Also explain fire safety measures?
- f) Write a note on:
 - 1) Low-cost housing
 - 2) Green building
- **g)** Write a note on:
 - 1) Scope of architecture
 - 2) Interior design of residential building

Section – II

- **Q.3** Design and Draw to scale of 1:50 a bungalow for a Civil Engineer. Provide for the following areas/rooms.
 - a) A living room
 - b) A Kitchen
 - c) Two Bed room
 - **d)** Toilet block
 - e) Staircase
 - f) Consulting Room
 - 1) Draw typical plan, 1:50 & show all details.
 - 2) Draw sectional elevation for above mentioned plan, scale 1:50 & show **10** all details.
- **Q.4** Draw perspective view of the following object, consider following data:
 - **a)** Use scale 1:100
 - **b**) Symbols have usual meaning
 - c) Preserve all ray lines



Max. Marks: 56





		,	book.				
		2)	Assume suitable data if necessar	ry and	d state it clearly.		
			MCQ/Objective Type	e Qu	estions		
ura	tion: 3	0 Mir	nutes			Marks:	14
.1	Choc 1)	se th The a) c)	ne correct alternatives from the energy correction factor for uniform one 1.02 to 1.5	optic m vel b) d)	ons and rewrite the sente ocity distribution is more than one 2	ence.	14
	2)	The func a) c)	second hydraulic exponent of cha tion of Aspect ratio of channel Normal flow depth	nnel b) d)	is usually slowly varying Critical flow depth Velocity of flow		
	3)	The dept a) b) c) d)	term alternate depthsis used in op hs having same kinetic energy for gi having same specific energy for a having same specific force for a having same total energy for give	iven d a give given en dis	nannel flow to denote the discharge en discharge discharge charge		
	4)	At tra a) b) c) d)	ansitional depth $\frac{dy}{dx} = \infty$ $\frac{dy}{dx} = -S_o$ The slope of G.V.F. profile is zero The slope of G.V.F. profile is hori	o izonta	al		
	5)	In ar a) b) c) d)	open channel flow, shooting flow Occur just after a hydraulic jump Be a gradually varied flow Follow a tranquil flow both b and c				
	6)	As p a) c)	er Francis formula for discharge o 0.86 0.623	ver re b) d)	ectangular weir value of C 0.68 1.84	_d is	
	7)	The veloo a) c)	discharge of water flowing over a city of approach is considered the Net datum head Still water head	recta head b) d)	ngular weir or notch when (H + ha) is usually known Net pressure head Net velocity head	the as	

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil** Engineering FLUID MECHANICS - II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

D

Seat

No.

SLR-FM-20

Max. Marks: 70

Set Ρ

- Which of the following turbine is suitable for Specific speed ranging from 8) 300 to 1000 and head below 30 m
 - Francis a) c)
- b) Kaplan
- Pelton
- d) Propeller
- The power which appears in expression of specific speed of turbine is _____. 9)
 - Shaft power a)

Water power b)

SLR-FM-20

- C) Runner power d) Power in to the turbine
- 10) When a steady jet impinges on a fixed inclined surface then _
 - The flow is divided into parts proportional to the angle of inclination of a) the surface
 - b) No force gets exerted on Plate
 - The momentum component remains unchanged parallel to surface c)
 - None of the above d)
- 11) The main advantage of double suction arrangement in centrifugal pump is
 - Increase in Axial thrust on impeller a)
 - Reduction in Axial thrust on impeller b)
 - Neutralisation of axial thrust on impeller C)
 - None of these d)
- 12) Chances of occurrence of cavitation are high if the _____.
 - Local pressure becomes very a)
 - Local temperature becomes low b)
 - Thomson's cavitations parameter exceeds a certain limit c)
 - Local pressure falls below the vapour pressure d)
- The dimensional form of any quantity is _____. 13)
 - Dependent on system of units a)
 - Sometimes dependent on systems of unit b)
 - Independent on system of unit C)
 - Sometimes independent on systems of unit d)
- 14) The variables those don't have any effect on phenomenon are called as _____.
 - a) Superfluous variables
- b) Repeating variables
- Non repeating variables d) C)
- **Dependent variables**

S.E. (Part - II) (CBCS) Examination Nov/Dec -2019

Civil Engineering FLUID MECHANICS - II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.

- 2) Answer any two questions from each section
- 3) Figures to the right indicate full marks.

Section - I

- Q.2 Explain the terms with neat sketches. a)
 - 1) Specific energy and
 - Specific force 2)
 - Draw the neat sketches of M₂ and H₃ water surface profiles and give there b) 02 conditions of formation.
 - Derive equation for time required to empty the tank by rectangular weir or 04 c) notch.
- Q.3 a) State the conditions under which the triangular section of an open channel 04 will be most economical. Derive these conditions.
 - b) Calculate the bottom width of cannel required to carry a discharge of 15.0 05 m³/s as a critical flow at a depth of 1.2 meter, if the channel section is
 - Rectangular and 1)
 - 2) Trapezoidal

with side slope of 1.5 horizontal to 1 vertical

- Q.4 Enumerate the assumptions made in derivation of gradually varied flow 04 a) and explain broad crested weir neat sketch.
 - Water flows through a rectangular channel 1 m wide and 0.5 m deep, and 05 b) then over a sharp crested Cipolletti weir of crest length 0.6 m. If the water level in the channel is 0.225 m above the weir crest, calculate the discharge over the weir. Take $C_d = 0.6$ and make correction for velocity of approach.
- Q.5 Show that, for broad crested weir, maximum discharge can occur when a) 04 flow depth over crest is critical.
 - What are the conditions of formation of hydraulic jump? Explain types and b) 05 uses of hydraulic jump.

Section - II

- Derive an expression for force exerted by a jet on stationary curved plate, Q.6 a) 03 when jet strikes at centre of symmetrical curved plate.
 - Define pump and turbine. What is difference in working principles of them? 04 b)
 - What is mean by distorted model? What are the purposes of constructing 03 c) distorted models?

Max. Marks: 56

04

SLR-FM-20

Set

Seat

No.

04

03

SLR-FM-20

- Explain with neat sketch constant speed characteristic curve of turbine. Q.7 a)
 - What should be the velocity of jet when it strikes a flat plate, normal of 06 b) which is inclined by 45° to axis of jet. The diameter of jet is 75 mm and normal pressure on plate is 2811.6 N
 - 1) When plate is stationary
 - 2) What should be the velocity of plate moving in direction of jet and away from jet, if normal pressure exerted by jet is 702.9 N. Also find the efficiency of jet when plate is moving
- **Q.8** a) Define Net positive suction head and explain the basic criterions for selection of centrifugal pump.
 - A centrifugal pump has an impeller of external and internal diameters as 06 b) 480 mm and 240 mm respectively, is running at a 100 r.p.m. the rate of flow through pump is 0.0576 m^3/s , velocity of flow is constant and equal to 2.4 m/s. The diameter of suction and delivery pipes are 180 mm and 120 mm respectively, suction and delivery heads are 6.2 m and 30.2 m of water respectively. If the power required to drive the pump is 23.3 kW and outlet vane angle is 45[°]. Determine
 - Inlet vane angle 1)
 - 2) Overall efficiency of pump
 - Manometric efficiency of pump 3)
- Explain the Buckingham's π theorem of dimensional analysis. Q.9 a)
 - A geometrical similar model of an air duct is built to 1:25 scale and tested 05 b) with water, which is 50 times more viscous and 800 times more denser than air. When tested under dynamically similar conditions, the pressure drop is 2 bars in model. Find corresponding pressure drop in prototype and express in water column.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering FLUID MECHANICS - II**

Day & Date: Tuesday, 26-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

C)

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - Which of the following turbine is suitable for Specific speed ranging from 1) 300 to 1000 and head below 30 m
 - a) Francis Pelton

- Kaplan b)
- Propeller d)
- The power which appears in expression of specific speed of turbine is _____. 2)
 - Shaft power Water power a) b)
 - Runner power d) Power in to the turbine C)
- When a steady jet impinges on a fixed inclined surface then 3)
 - The flow is divided into parts proportional to the angle of inclination of a) the surface
 - b) No force gets exerted on Plate
 - The momentum component remains unchanged parallel to surface c)
 - None of the above d)
- 4) The main advantage of double suction arrangement in centrifugal pump is
 - Increase in Axial thrust on impeller a)
 - b) Reduction in Axial thrust on impeller
 - Neutralisation of axial thrust on impeller c)
 - None of these d)
- Chances of occurrence of cavitation are high if the . 5)
 - Local pressure becomes very a)
 - Local temperature becomes low b)
 - Thomson's cavitations parameter exceeds a certain limit C)
 - Local pressure falls below the vapour pressure d)
- 6) The dimensional form of any quantity is _____.
 - Dependent on system of units a)
 - b) Sometimes dependent on systems of unit
 - Independent on system of unit C)
 - Sometimes independent on systems of unit d)
- 7) The variables those don't have any effect on phenomenon are called as _____.
 - Superfluous variables a) C)
- Repeating variables b)
- Non repeating variables d) Dependent variables

Max. Marks: 70

Marks: 14

SLR-FM-20



- The energy correction factor for uniform velocity distribution is _____. 8) more than one a) one b) 1.02 to 1.5 d) 2 C) 9) The second hydraulic exponent of channel is usually slowly varying function of Aspect ratio of channel Critical flow depth a) b) c) Normal flow depth d) Velocity of flow 10) The term alternate depthsis used in open channel flow to denote the depths _ having same kinetic energy for given discharge a) having same specific energy for a given discharge b) having same specific force for a given discharge c) having same total energy for given discharge d) 11) At transitional depth _____. $\frac{dy}{dx} = \infty$ a) $\frac{dy}{dx} = -S_o$ b) The slope of G.V.F. profile is zero c) The slope of G.V.F. profile is horizontal d) In an open channel flow, shooting flow 12) Occur just after a hydraulic jump a) Be a gradually varied flow b) c) Follow a tranquil flow both b and c d) 13) As per Francis formula for discharge over rectangular weir value of C_d is _____. a) 0.86 b) 0.68 0.623 d) 1.84 C) The discharge of water flowing over a rectangular weir or notch when the 14) velocity of approach is considered the head (H + ha) is usually known as _____. Net datum head Net pressure head b) a) Net velocity head
 - C) Still water head
- d)

S.E. (Part - II) (CBCS) Examination Nov/Dec -2019 Civil Engineering

FLUID MECHANICS - II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.

- 2) Answer any two questions from each section
- 3) Figures to the right indicate full marks.

Section - I

- **Q.2** a) Explain the terms with neat sketches.
 - 1) Specific energy and
 - 2) Specific force
 - b) Draw the neat sketches of M_2 and H_3 water surface profiles and give there **02** conditions of formation.
 - c) Derive equation for time required to empty the tank by rectangular weir or 04 notch.
- Q.3 a) State the conditions under which the triangular section of an open channel 04 will be most economical. Derive these conditions.
 - b) Calculate the bottom width of cannel required to carry a discharge of 15.0
 05 m³/s as a critical flow at a depth of 1.2 meter, if the channel section is
 - 1) Rectangular and
 - 2) Trapezoidal

with side slope of 1.5 horizontal to 1 vertical

- Q.4 a) Enumerate the assumptions made in derivation of gradually varied flowO4 and explain broad crested weir neat sketch.
 - b) Water flows through a rectangular channel 1 m wide and 0.5 m deep, and 05 then over a sharp crested Cipolletti weir of crest length 0.6 m. If the water level in the channel is 0.225 m above the weir crest, calculate the discharge over the weir. Take $C_d = 0.6$ and make correction for velocity of approach.
- Q.5 a) Show that, for broad crested weir, maximum discharge can occur when 04 flow depth over crest is critical.
 - b) What are the conditions of formation of hydraulic jump? Explain types and 05 uses of hydraulic jump.

Section - II

- Q.6 a) Derive an expression for force exerted by a jet on stationary curved plate, 03 when jet strikes at centre of symmetrical curved plate.
 - b) Define pump and turbine. What is difference in working principles of them? 04
 - c) What is mean by distorted model? What are the purposes of constructing 03 distorted models?

Max. Marks: 56

04

SLR-FM-20

Set

Seat No.

04

03

- SLR-FM-20 Set
- Explain with neat sketch constant speed characteristic curve of turbine. Q.7 a)
 - What should be the velocity of jet when it strikes a flat plate, normal of 06 b) which is inclined by 45° to axis of jet. The diameter of jet is 75 mm and normal pressure on plate is 2811.6 N
 - 1) When plate is stationary
 - 2) What should be the velocity of plate moving in direction of jet and away from jet, if normal pressure exerted by jet is 702.9 N. Also find the efficiency of jet when plate is moving
- **Q.8** a) Define Net positive suction head and explain the basic criterions for selection of centrifugal pump.
 - A centrifugal pump has an impeller of external and internal diameters as 06 b) 480 mm and 240 mm respectively, is running at a 100 r.p.m. the rate of flow through pump is 0.0576 m^3/s , velocity of flow is constant and equal to 2.4 m/s. The diameter of suction and delivery pipes are 180 mm and 120 mm respectively, suction and delivery heads are 6.2 m and 30.2 m of water respectively. If the power required to drive the pump is 23.3 kW and outlet vane angle is 45[°]. Determine
 - Inlet vane angle 1)
 - 2) Overall efficiency of pump
 - Manometric efficiency of pump 3)
- Explain the Buckingham's π theorem of dimensional analysis. Q.9 a)
 - A geometrical similar model of an air duct is built to 1:25 scale and tested 05 b) with water, which is 50 times more viscous and 800 times more denser than air. When tested under dynamically similar conditions, the pressure drop is 2 bars in model. Find corresponding pressure drop in prototype and express in water column.

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering FLUID MECHANICS - II**

Day & Date: Tuesday, 26-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

c)

1)

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - In an open channel flow, shooting flow .
 - Occur just after a hydraulic jump a)
 - b) Be a gradually varied flow
 - Follow a tranquil flow c)
 - both b and c d)
 - As per Francis formula for discharge over rectangular weir value of C_d is _____. 2)
 - 0.86 b) 0.68
 - 0.623 d) 1.84 c)
 - The discharge of water flowing over a rectangular weir or notch when the 3) velocity of approach is considered the head (H + ha) is usually known as _____.
 - Net datum head a) Still water head
- Net pressure head b) Net velocity head d)

Kaplan

- 4) Which of the following turbine is suitable for Specific speed ranging from 300 to 1000 and head below 30 m
 - a) Francis b)
 - Propeller C) Pelton d)
- The power which appears in expression of specific speed of turbine is _____. 5)
 - Shaft power Water power a) b)
 - Runner power d) Power in to the turbine C)
- When a steady jet impinges on a fixed inclined surface then _____ 6)
 - The flow is divided into parts proportional to the angle of inclination of a) the surface
 - No force gets exerted on Plate b)
 - The momentum component remains unchanged parallel to surface c)
 - None of the above d)
- 7) The main advantage of double suction arrangement in centrifugal pump is
 - Increase in Axial thrust on impeller a)
 - Reduction in Axial thrust on impeller b)
 - Neutralisation of axial thrust on impeller c)
 - None of these d)

SLR-FM-20



Max. Marks: 70

Marks: 14

- 8) Chances of occurrence of cavitation are high if the _____.
 - a) Local pressure becomes very
 - b) Local temperature becomes low
 - c) Thomson's cavitations parameter exceeds a certain limit
 - d) Local pressure falls below the vapour pressure
- 9) The dimensional form of any quantity is _____.
 - a) Dependent on system of units
 - b) Sometimes dependent on systems of unit
 - c) Independent on system of unit
 - d) Sometimes independent on systems of unit
- 10) The variables those don't have any effect on phenomenon are called as _____.
 - a) Superfluous variables
- b) Repeating variables

- c) Non repeating variables d) Dependent variables
- 11) The energy correction factor for uniform velocity distribution is _____.
 - a) one b) more than one
 - c) 1.02 to 1.5 d) 2
- 12) The second hydraulic exponent of channel is usually slowly varying function of _____.
 - a) Aspect ratio of channel
- b) Critical flow depth
- c) Normal flow depth d) Velocity of flow
- 13) The term alternate depthsis used in open channel flow to denote the depths _____.
 - a) having same kinetic energy for given discharge
 - b) having same specific energy for a given discharge
 - c) having same specific force for a given discharge
 - d) having same total energy for given discharge
- 14) At transitional depth _____.

a)
$$\frac{dy}{dy} = \infty$$

b)
$$\frac{dx}{dy} = -S$$

- $\frac{dx}{dx} = -S_o$
- c) The slope of G.V.F. profile is zero
- d) The slope of G.V.F. profile is horizontal

S.E. (Part - II) (CBCS) Examination Nov/Dec -2019

Civil Engineering FLUID MECHANICS - II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.

- 2) Answer any two questions from each section
- 3) Figures to the right indicate full marks.

Section - I

- Q.2 Explain the terms with neat sketches. a)
 - 1) Specific energy and
 - Specific force 2)
 - Draw the neat sketches of M₂ and H₃ water surface profiles and give there b) 02 conditions of formation.
 - Derive equation for time required to empty the tank by rectangular weir or 04 c) notch.
- Q.3 a) State the conditions under which the triangular section of an open channel 04 will be most economical. Derive these conditions.
 - b) Calculate the bottom width of cannel required to carry a discharge of 15.0 05 m³/s as a critical flow at a depth of 1.2 meter, if the channel section is
 - Rectangular and 1)
 - 2) Trapezoidal

with side slope of 1.5 horizontal to 1 vertical

- Q.4 04 a) Enumerate the assumptions made in derivation of gradually varied flow and explain broad crested weir neat sketch.
 - Water flows through a rectangular channel 1 m wide and 0.5 m deep, and 05 b) then over a sharp crested Cipolletti weir of crest length 0.6 m. If the water level in the channel is 0.225 m above the weir crest, calculate the discharge over the weir. Take $C_d = 0.6$ and make correction for velocity of approach.
- Q.5 Show that, for broad crested weir, maximum discharge can occur when a) 04 flow depth over crest is critical.
 - What are the conditions of formation of hydraulic jump? Explain types and b) 05 uses of hydraulic jump.

Section - II

- Derive an expression for force exerted by a jet on stationary curved plate, Q.6 a) 03 when jet strikes at centre of symmetrical curved plate.
 - Define pump and turbine. What is difference in working principles of them? 04 b)
 - What is mean by distorted model? What are the purposes of constructing 03 c) distorted models?

Max. Marks: 56

SLR-FM-20

Set



04

03

- **Q.7** a) Explain with neat sketch constant speed characteristic curve of turbine.
 - b) What should be the velocity of jet when it strikes a flat plate, normal of 06 which is inclined by 45⁰ to axis of jet, The diameter of jet is 75 mm and normal pressure on plate is 2811.6 N
 - 1) When plate is stationary
 - 2) What should be the velocity of plate moving in direction of jet and away from jet, if normal pressure exerted by jet is 702.9 N. Also find the efficiency of jet when plate is moving
- **Q.8 a)** Define Net positive suction head and explain the basic criterions for selection of centrifugal pump.
 - b) A centrifugal pump has an impeller of external and internal diameters as 480 mm and 240 mm respectively, is running at a 100 r.p.m. the rate of flow through pump is 0.0576 m³/s, velocity of flow is constant and equal to 2.4 m/s. The diameter of suction and delivery pipes are 180 mm and 120 mm respectively, suction and delivery heads are 6.2 m and 30.2 m of water respectively. If the power required to drive the pump is 23.3 kW and outlet vane angle is 45⁰. Determine
 - 1) Inlet vane angle
 - 2) Overall efficiency of pump
 - 3) Manometric efficiency of pump
- **Q.9** a) Explain the Buckingham's π theorem of dimensional analysis.
 - b) A geometrical similar model of an air duct is built to 1:25 scale and tested with water, which is 50 times more viscous and 800 times more denser than air. When tested under dynamically similar conditions, the pressure drop is 2 bars in model. Find corresponding pressure drop in prototype and express in water column.

SLR-FM-20 Set R

S.E. (Part - II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering FLUID MECHANICS - II**

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Assume suitable data if necessary and state it clearly.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- When a steady jet impinges on a fixed inclined surface then 1)
 - The flow is divided into parts proportional to the angle of inclination of a) the surface
 - b) No force gets exerted on Plate
 - The momentum component remains unchanged parallel to surface c)
 - None of the above d)
 - 2) The main advantage of double suction arrangement in centrifugal pump
 - is Increase in Axial thrust on impeller a)
 - Reduction in Axial thrust on impeller b)
 - C) Neutralisation of axial thrust on impeller
 - d) None of these
 - Chances of occurrence of cavitation are high if the _____. 3)
 - a) Local pressure becomes very
 - b) Local temperature becomes low
 - Thomson's cavitations parameter exceeds a certain limit c)
 - Local pressure falls below the vapour pressure d)
 - The dimensional form of any quantity is _____. 4)
 - Dependent on system of units a)
 - b) Sometimes dependent on systems of unit
 - Independent on system of unit c)
 - Sometimes independent on systems of unit d)
 - The variables those don't have any effect on phenomenon are called as . 5)
 - Superfluous variables a) b)
 - Non repeating variables d) Dependent variables C)
 - The energy correction factor for uniform velocity distribution is _____. 6)
 - a) one b) more than one
 - 1.02 to 1.5 c) d) 2
 - The second hydraulic exponent of channel is usually slowly varying 7) function of Critical flow depth
 - Aspect ratio of channel a) b)
 - Normal flow depth c) d)

Max. Marks: 70

SLR-FM-20

Set



Marks: 14

14

- **Repeating variables**

Velocity of flow

- The term alternate depthsis used in open channel flow to denote the depths _____.
 - a) having same kinetic energy for given discharge
 - b) having same specific energy for a given discharge
 - c) having same specific force for a given discharge
 - d) having same total energy for given discharge
- 9) At transitional depth _____.

a)
$$\frac{dy}{dx} = \infty$$

b)
$$\frac{dy}{dt} = -S_{a}$$

- c) dx = 0The slope of G.V.F. profile is zero
- d) The slope of G.V.F. profile is horizontal
- 10) In an open channel flow, shooting flow _____.
 - a) Occur just after a hydraulic jump
 - b) Be a gradually varied flow
 - c) Follow a tranquil flow
 - d) both b and c

a)

- 11) As per Francis formula for discharge over rectangular weir value of C_d is _____.
 - 0.86 b) 0.68
 - c) 0.623 d) 1.84
- 12) The discharge of water flowing over a rectangular weir or notch when the velocity of approach is considered the head (H + ha) is usually known as _____.
 - a) Net datum head b) N
 - Net pressure head

SLR-FM-20

Set

- c) Still water head
- d) Net velocity head
- 13) Which of the following turbine is suitable for Specific speed ranging from 300 to 1000 and head below 30 m
 - a) Francis b) c) Pelton d)
 - d) Propeller

Kaplan

- 14) The power which appears in expression of specific speed of turbine is _____.
 - a) Shaft power

b) Water power

c) Runner power

d) Power in to the turbine

S.E. (Part - II) (CBCS) Examination Nov/Dec -2019 Civil Engineering

FLUID MECHANICS - II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.

- 2) Answer any two questions from each section
- 3) Figures to the right indicate full marks.

Section - I

- **Q.2** a) Explain the terms with neat sketches.
 - 1) Specific energy and
 - 2) Specific force
 - b) Draw the neat sketches of M_2 and H_3 water surface profiles and give there **02** conditions of formation.
 - c) Derive equation for time required to empty the tank by rectangular weir or 04 notch.
- Q.3 a) State the conditions under which the triangular section of an open channel 04 will be most economical. Derive these conditions.
 - b) Calculate the bottom width of cannel required to carry a discharge of 15.0
 05 m³/s as a critical flow at a depth of 1.2 meter, if the channel section is
 - 1) Rectangular and
 - 2) Trapezoidal

with side slope of 1.5 horizontal to 1 vertical

- Q.4 a) Enumerate the assumptions made in derivation of gradually varied flowO4 and explain broad crested weir neat sketch.
 - b) Water flows through a rectangular channel 1 m wide and 0.5 m deep, and then over a sharp crested Cipolletti weir of crest length 0.6 m. If the water level in the channel is 0.225 m above the weir crest, calculate the discharge over the weir. Take $C_d = 0.6$ and make correction for velocity of approach.
- Q.5 a) Show that, for broad crested weir, maximum discharge can occur when 04 flow depth over crest is critical.
 - b) What are the conditions of formation of hydraulic jump? Explain types and 05 uses of hydraulic jump.

Section - II

- Q.6 a) Derive an expression for force exerted by a jet on stationary curved plate, 03 when jet strikes at centre of symmetrical curved plate.
 - b) Define pump and turbine. What is difference in working principles of them? 04
 - c) What is mean by distorted model? What are the purposes of constructing 03 distorted models?

Max. Marks: 56

SLR-FM-20

Set



Seat No.



- **Q.7** a) Explain with neat sketch constant speed characteristic curve of turbine.
 - b) What should be the velocity of jet when it strikes a flat plate, normal of 06 which is inclined by 45⁰ to axis of jet, The diameter of jet is 75 mm and normal pressure on plate is 2811.6 N
 - 1) When plate is stationary
 - 2) What should be the velocity of plate moving in direction of jet and away from jet, if normal pressure exerted by jet is 702.9 N. Also find the efficiency of jet when plate is moving
- **Q.8 a)** Define Net positive suction head and explain the basic criterions for selection of centrifugal pump.
 - b) A centrifugal pump has an impeller of external and internal diameters as 480 mm and 240 mm respectively, is running at a 100 r.p.m. the rate of flow through pump is 0.0576 m³/s, velocity of flow is constant and equal to 2.4 m/s. The diameter of suction and delivery pipes are 180 mm and 120 mm respectively, suction and delivery heads are 6.2 m and 30.2 m of water respectively. If the power required to drive the pump is 23.3 kW and outlet vane angle is 45⁰. Determine
 - 1) Inlet vane angle
 - 2) Overall efficiency of pump
 - 3) Manometric efficiency of pump
- **Q.9** a) Explain the Buckingham's π theorem of dimensional analysis.
 - b) A geometrical similar model of an air duct is built to 1:25 scale and tested with water, which is 50 times more viscous and 800 times more denser than air. When tested under dynamically similar conditions, the pressure drop is 2 bars in model. Find corresponding pressure drop in prototype and express in water column.

SLR-FM-20 Set S

03

Seat No.

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Rainfall mass cure is variation of 1)
 - Rainfall intensity with time a)
 - b) Rainfall intensity with cumulative rainfall
 - c) Rainfall excess with time
 - d) Cumulative rainfall with time
- 2) Flow duration cure is plot of
 - a) Accumulated flow against time
 - Discharge against time in chronological order b)
 - c) The base flow against the percentage of times the flow exceeded
 - The stream discharge against the percentage of times the flow is d) equaled or exceeded
- 3) Which of the following formations neither contains water nor transmits it?
 - a) Aquiclude b)
 - c) Aquifuge Aquitard d)
- If e_w and e_a are the saturated vapour pressure of the water surface and 4) air respectively, the Daltons law for evaporation EL in unit time is given by EL=
 - $(e_w e_a)$ a) b)
 - K e_we_a c) K ($e_w - e_a$) d) $K(e_w + e_a)$
- 5) Interception losses
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- The percentage of total quantity of fresh water in the world available in 6) the liquid form _____.
 - a) 30% 70% b)
 - c) 11 % d) 51%

Max. Marks: 70

Marks: 14

Aquifer



SLR-FM-21



S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Distance

Velocity at

(m) Depth

(m)

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7, and 9 from section II

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section – I

- A) Briefly discuss the factors affecting evaporation. What are the methods Q.2 05 used to control evaporation from reservoir.
 - A precipitation station 'X' was inoperative for some time during which a B) 04 storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X. A. B. & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- Q.3 What is meant by runoff? Explain methods of separation of base flow. A)
 - The ordinates of 3-hr unit hydrograph are given as below. Using this data B) derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

6

1.8

0.6

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

8

2.4

0.9

10

2.6

1.2

12

2.0

0.9

14

1.8

0.7

16

1.6

0.5

18

1.0

0.3

20

0

0

What is flood and discuss the various factors affecting flood? Q.4 A) B) Estimate the stream flow for the measurement data as given.

4

1.2

0.4

2

0.5

0.3

0

0

0

0.2d (m/s) Velocity at 0.4 0 0.2 0.35 0.45 0.4 0.3 0.4 0.5 0.2 0 0.8d (m/s) Q.5 A) Enlist, classify and discuss in brief geological formation where round water 05 occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The 04 strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Max. Marks: 56

05

05

04 05



Seat No.

Set P

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05 i) Field capacity of soil = 30%
 - ii) Permanent Wilting point = 11%
 - iii) Density of soil = 1300 kg/m^3
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop
Сюр	Dase period (days)	(ha/cumec)	(ha)
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetables	120	700	1400

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Duration: 30 Minutes

Seat No.

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The most economical method of soil conservation is to 1)
 - construct contour bunds
 - a) construct check dams c) Drain the soil
- 2) Consumptive use of water for a crop represents _____.
 - a) Transpiration needs of the crop
 - b) Evaporation needs of the cropped area
 - c) Evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism.
 - d) None of the above
- 3) The method of growing crops on ridges, running on the sides of water ditches is known as .
 - a) Flood irrigation
 - d) c) Check irrigation
- 4) If the depth is 8.64cm on a field over a base period of 10 days, then the dutv is .
 - a) 10 ha/cumec b)
 - c) 864 ha/cumec d)

5) Irrigation potential of the country is about _____

- a) 87 Mha b)
- c) 113 Mha d) 125 Mha
- 6) Lift irrigation is flow .
 - a) by gravity
 - c) in delta region d)
- The best method of applying water to sandy undulating area is _____. 7)
 - a) Free flooding c) Subsurface irrigation
 - Furrow method b) Sprinkler irrigation d)
- Rainfall mass cure is variation of 8)
 - a) Rainfall intensity with time
 - b) Rainfall intensity with cumulative rainfall
 - Rainfall excess with time c)
 - d) Cumulative rainfall with time

Max. Marks: 70

- Furrow irrigation
- None of them
- 100 ha/cumec
 - 1000 ha/cumec
 - - 100 Mha

 - b) from lower level to higher level
 - through sprinkler heads

- Marks: 14

- b)

b) d) Aforest the soil



- 9) Flow duration cure is plot of _____
 - a) Accumulated flow against time
 - b) Discharge against time in chronological order
 - c) The base flow against the percentage of times the flow exceeded
 - d) The stream discharge against the percentage of times the flow is equaled or exceeded
- 10) Which of the following formations neither contains water nor transmits it?
 - a) Aquiclude b) Aquifer
 - c) Aquifuge d) Aquitard
- If e_w and e_a are the saturated vapour pressure of the water surface and air respectively, the Daltons law for evaporation EL in unit time is given by EL= _____.

b)

K e_we_a

- a) $(e_w e_a)$
- c) K $(e_w e_a)$ d) K $(e_w + e_a)$
- 12) Interception losses _____
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- 13) The percentage of total quantity of fresh water in the world available in the liquid form _____.
 - a) 30% b) 70%
 - c) 11 % d) 51%
- 14) The dilution method of stream gauging is ideally suited for measuring discharge in _____.
 - a) A large alluvial rivers
 - b) Flood flow in mountain stream
 - c) Steady flow in a small turbulent stream
 - d) A stretch of river having heavy industrial pollution load

SLR-FM-21

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING – I Day & Date: Wednesday, 27-11-2019

Time: 02:30 PM To 5:30 PM

- **Instructions:** 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7, and 9 from section II
 - 2) Assume suitable data wherever necessary and mention it clearly.
 - 3) Figures to the right indicate full marks.
 - 4) Use of non-programmable calculator is allowed.

Section – I

- A) Briefly discuss the factors affecting evaporation. What are the methods Q.2 05 used to control evaporation from reservoir.
 - A precipitation station 'X' was inoperative for some time during which a B) 04 storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X, A, B, & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- Q.3 What is meant by runoff? Explain methods of separation of base flow. A)
 - The ordinates of 3-hr unit hydrograph are given as below. Using this data B) derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

What is flood and discuss the various factors affecting flood? Q.4 A) B)

0

0.8d (m/s)

0.2

0.3

Distance 0 2 4 6 8 10 12 14 18 16 (m) Depth

Q.5	A)	Enlist, classify and discuss in brief geological formation where round water	05
		OCCUIS.	

0.35

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The 04 strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Estimate the stream flow for the measurement data as given. 20 0 0.5 1.2 1.8 2.4 2.6 2.0 1.8 1.6 1.0 0 (m) Velocity at 0 0.3 0.4 0.6 0.9 1.2 0.9 0.7 0.5 0.3 0 0.2d (m/s) Velocity at

0.4

0.45

0.4

0.5

0.4

0.2

0

Max. Marks: 56

05

04

05

05

Seat No.

SetQ

05

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05
 i) Field capacity of soil = 30%
 ii) Permanent Wilting point = 11%
 - iii) Density of soil = 1300 kg/m^3
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop				
Сюр	Dase period (days)	Duty at field Area under the cl (ha/cumec) (ha) 1800 4800					
Wheat	120	1800	4800				
Sugarcane	360	800	5600				
Cotton	200	1400	2400				
Rice	120	900	3200				
Vegetables	120	700	1400				

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

Seat No.

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Interception losses ____
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- 2) The percentage of total quantity of fresh water in the world available in the liquid form _____.
 - a) 30% b) 70%
 - c) 11 % d) 51%
- 3) The dilution method of stream gauging is ideally suited for measuring discharge in _____.
 - a) A large alluvial rivers
 - b) Flood flow in mountain stream
 - c) Steady flow in a small turbulent stream
 - d) A stretch of river having heavy industrial pollution load
- 4) The most economical method of soil conservation is to _____
 - a) construct check dams b) construct contour bunds
 - c) Drain the soil d) Aforest the soil
- 5) Consumptive use of water for a crop represents _____.
 - a) Transpiration needs of the crop
 - b) Evaporation needs of the cropped area
 - c) Evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism.
 - d) None of the above
- 6) The method of growing crops on ridges, running on the sides of water ditches is known as _____.
 - a) Flood irrigation b) Furrow irrigation
 - c) Check irrigation d) None of them
- If the depth is 8.64cm on a field over a base period of 10 days, then the duty is _____.
 - a) 10 ha/cumec
 - c) 864 ha/cumec
- b) 100 ha/cumec
- d) 1000 ha/cumec

Max. Marks: 70

Marks: 14

SLR-FM-21



Set R

SLR-FM-21

- 8) Irrigation potential of the country is about _____
 - a) 87 Mha
 - b) 100 Mha d) 125 Mha
- 9) Lift irrigation is flow _____.

c) in delta region

c) 113 Mha

a)

- a) by gravity
- b) from lower level to higher level
- d) through sprinkler heads

10) The best method of applying water to sandy undulating area is _____.

- Free flooding b) Furrow method
- c) Subsurface irrigation d) Sprinkler irrigation
- 11) Rainfall mass cure is variation of _____.
 - a) Rainfall intensity with time
 - b) Rainfall intensity with cumulative rainfall
 - c) Rainfall excess with time
 - d) Cumulative rainfall with time
- 12) Flow duration cure is plot of ____
 - a) Accumulated flow against time
 - b) Discharge against time in chronological order
 - c) The base flow against the percentage of times the flow exceeded
 - d) The stream discharge against the percentage of times the flow is equaled or exceeded
- 13) Which of the following formations neither contains water nor transmits it?
 - a) Aquiclude

- b) Aquifer
- c) Aquifuge d) Aquitard
- 14) If e_w and e_a are the saturated vapour pressure of the water surface and air respectively, the Daltons law for evaporation EL in unit time is given by EL= _____.
 - a) $(\overline{e_w e_a})$
 - c) K (e_w e_a)

- b) K e_we_a
- d) $K(e_w + e_a)$

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Distance

Velocity at

0.2d (m/s)

(m) Depth

(m)

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7,and 9 from section II

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section – I

- Q.2 A) Briefly discuss the factors affecting evaporation. What are the methods 05 used to control evaporation from reservoir.
 - B) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X, A, B, & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- **Q.3** A) What is meant by runoff? Explain methods of separation of base flow.
 - B) The ordinates of 3-hr unit hydrograph are given as below. Using this data derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

6

1.8

0.6

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

8

2.4

0.9

10

2.6

1.2

12

2.0

0.9

14

1.8

0.7

16

1.6

0.5

18

1.0

0.3

20

0

0

Q.4 A) What is flood and discuss the various factors affecting flood?B) Estimate the stream flow for the measurement data as given.

4

1.2

0.4

2

0.5

0.3

0

0

0

Velocity at 0 0.2 0.35 0.45 0.4 0.3 0.4 0.4 0.5 0.2 0 0.8d (m/s) Q.5 A) Enlist, classify and discuss in brief geological formation where round water 05 occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Civil Engineering WATER RESOURCES ENGINEERING – I

Max. Marks: 56

04 05

05

05



Seat No.

Set R

05

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05
 - i) Field capacity of soil = 30%
 - ii) Permanent Wilting point = 11%
 - iii) Density of soil = 1300 kg/m^3
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop
Сюр	Dase period (days)	(ha/cumec)	(ha)
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetables	120	700	1400

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- The method of growing crops on ridges, running on the sides of water 1)
 - ditches is known as _____.
 - a) Flood irrigation b)
 - c) Check irrigation d)
- 2) If the depth is 8.64cm on a field over a base period of 10 days, then the dutv is
 - a) 10 ha/cumec b)
 - c) 864 ha/cumec d) 1000 ha/cumec
- Irrigation potential of the country is about _ 3)
 - a) 87 Mha b)
 - c) 113 Mha d)
- 4) Lift irrigation is flow _____.
 - a) by gravity
 - c) in delta region d)
- The best method of applying water to sandy undulating area is . 5)
 - a) Free flooding b)
 - c) Subsurface irrigation d)
- Rainfall mass cure is variation of 6)
 - a) Rainfall intensity with time
 - b) Rainfall intensity with cumulative rainfall
 - c) Rainfall excess with time
 - d) Cumulative rainfall with time
- 7) Flow duration cure is plot of _
 - a) Accumulated flow against time
 - Discharge against time in chronological order b)
 - c) The base flow against the percentage of times the flow exceeded
 - d) The stream discharge against the percentage of times the flow is equaled or exceeded
- 8) Which of the following formations neither contains water nor transmits it?
 - Aquiclude Aquifer b) a)
 - Aquifuge c) d) Aquitard



Marks: 14

14

SLR-FM-21



- Furrow irrigation
- None of them

- 100 ha/cumec
- - 100 Mha
 - 125 Mha

 - b) from lower level to higher level
 - through sprinkler heads
 - Furrow method Sprinkler irrigation

Duration: 30 Minutes

Seat No.





- If e_w and e_a are the saturated vapour pressure of the water surface and air respectively, the Daltons law for evaporation EL in unit time is given by EL= _____.
 - a) $(e_w e_a)$ c) K $(e_w - e_a)$

b) $K e_w e_a$ d) $K(e_w + e_a)$

- 10) Interception losses _____
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- 11) The percentage of total quantity of fresh water in the world available in the liquid form _____.
 - a) 30% b) 70%
 - c) 11 % d) 51%
- 12) The dilution method of stream gauging is ideally suited for measuring discharge in _____.
 - a) A large alluvial rivers
 - b) Flood flow in mountain stream
 - c) Steady flow in a small turbulent stream
 - d) A stretch of river having heavy industrial pollution load
- 13) The most economical method of soil conservation is to _
 - a) construct check dams
- b) construct contour bunds
- c) Drain the soil d) Aforest the soil
- 14) Consumptive use of water for a crop represents _____.
 - a) Transpiration needs of the crop
 - b) Evaporation needs of the cropped area
 - c) Evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism.
 - d) None of the above

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Distance

(m) Depth

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7, and 9 from section II

- 2) Assume suitable data wherever necessary and mention it clearly.
- Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section – I

- Briefly discuss the factors affecting evaporation. What are the methods Q.2 A) 05 used to control evaporation from reservoir.
 - A precipitation station 'X' was inoperative for some time during which a B) 04 storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X, A, B, & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- What is meant by runoff? Explain methods of separation of base flow. Q.3 A)
 - The ordinates of 3-hr unit hydrograph are given as below. Using this data B) derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

8

10

12

14

16

18

20

What is flood and discuss the various factors affecting flood? Q.4 A) B) Estimate the stream flow for the measurement data as given.

4

2

0

0 0.5 1.2 1.8 2.4 2.6 2.0 1.8 1.6 1.0 0 (m) Velocity at 0 0.3 0.4 0.6 0.9 1.2 0.9 0.7 0.5 0.3 0 0.2d (m/s) Velocity at 0.4 0 0.2 0.35 0.45 0.3 0.4 0.4 0.5 0.2 0 0.8d (m/s)

6

Q.5 A) Enlist, classify and discuss in brief geological formation where round water 05 occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The 04 strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Max. Marks: 56

05

04

05

Seat	
No.	
Set S

05

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05

 i) Field capacity of soil = 30%
 ii) Permanent Wilting point = 11%
 iii) Density of soil = 1300 kg/m³
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop	
	Dase period (days)	(ha/cumec)	(ha)	
Wheat	120	1800	4800	
Sugarcane	360	800	5600	
Cotton	200	1400	2400	
Rice	120	900	3200	
Vegetables	120	700	1400	

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

	S.E. (Part. II) (CPCS) Exa
No	
Seat	

mination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Answer Book page No.3. Each questions carries one mark.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

The P.I. of X = x.V, where V is a function of x is _____. 1)

a)	$\left[x + \frac{f^{1}(D)}{f(D)}\right] \frac{1}{f(D)} V$	b) $\left[x - \frac{1}{f(D)}f^{1}(D)\right]\frac{1}{f(D)}V$
c)	$\left[x - \frac{f(D)}{f^1(D)}\right] \frac{1}{f(D)} V$	d) $\left[x + \frac{1}{f^{1}(D)}f(D)\right]\frac{1}{f(D)}V$

- The general solution of $(D^4 + 6D^2 + 9)y = 0$ is _____. 2)
 - a) $y = (C_1 + C_2 x) \cos \sqrt{3}x + (C_3 + C_4 x) \sin \sqrt{3}x$
 - b) $y = (C_1 + C_2 x)e^x + (C_3 + C_{4x})e^{-x}$
 - c) $y = (C_1 + C_2)e^{-x} + (C_3 + C_4x)e^x$
 - d) $y = (C_1 + C_2 \cos x)e^x + (C_3 + C_4 \sin x)e^x$

3) On putting log(5 + 2x) = Z the differential equation $(\mathbf{F} + 2\alpha)^{d^2y} = ((\mathbf{F} + 2\alpha)^{dy} + 2\alpha - 6\alpha)$ in transform

$$(5+2x)\frac{ay}{dx^2} - 6(5+2x)\frac{ay}{dx} + 8y = 6x \text{ is transformed to} ___.$$

a) $(D^2 + 4D + 2)y = \frac{3}{4}(e^z - 5)$ b) $(D^2 + 4D + 4)y = \frac{3}{4}(e^z - 5)$
c) $(D^2 - 4D + 2)y = \frac{3}{4}(e^z - 5)$ d) $(D^2 - 4D + 2)y = 3(e^z - 5)$

4) The solution of equation
$$p + q = pq$$
 is _____.

- a) z = ax + (a + 1)y + c
- b) z = (a + 1)x + a(a 1)y + c
- c) z = (a-1)x + a(a+1)y + c
- d) z(a-1) = a(a-1)x + ay + c

The solution of the equation (mz - ny)p + (nx - lz)q = ly - mx is _____. 5)

- a) $\phi(\ell x + my + nz, x^2 + y^2 + z^2) = 0$
- b) $\phi(\ell x my + nz, x^2 + y^2 + z^2) = 0$
- c) $\phi(\ell x + my + nz, x^2 + y^2 z^2) = 0$
- d) $\phi(\ell x + my + nz, x^2 y^2 + z^2) = 0$

Max. Marks: 70

Marks: 14

Set

			Set P
6)	If $L\{f_1(t)\} = \phi_1(s)$ and $L\{f_2(t)\} = \phi_2(s)$	2(s),	then $L^{-1}\{\phi_1(s)^*\phi_2(s)\} =$
	a) $\int_{0}^{0} f_1(u) f_2(t-u) du$	b)	$\int_{0} f_1(t) f_2(t-u) du$
	c) $\int_{0}^{\cdot} f_1(u)f_2(t-u)du$	d)	None of these
7)	The value of integral $\int_{0}^{\infty} t^{5} e^{-3t} dt$	is	
	a) $\frac{1}{243}$	b)	<u>40</u> 243
	c) $\frac{4}{243}$	d)	<u>80</u> 243
8)	Polar form of C-R equation are a) $\frac{\partial u}{\partial \theta} = \frac{1}{r} \frac{\partial v}{\partial r}, \frac{\partial u}{\partial r} = r \frac{\partial v}{\partial \theta}$ c) $\frac{\partial u}{\partial r} = r \frac{\partial v}{\partial r}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$	b) d)	$\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ None of these
9)	$\int \frac{z+10}{z^2-4} dz$ Where C is the circle	z =	1 is
	a) 2π c) $2\pi i$	b) d)	-2π 0
10)	The Fourier expansion is the interval $f(x) = -x, -4 \le x \le 0$ $= x 0 \le x \le 4$ has a) No sine terms b) Both cosing & sing terms	b)	4, 4] of the function No cosine terms
11)	The conditions for expansion of a fu	nctio	on in Fourier series are known as
	a) Harmonicc) Dirichlets condition	b) d)	Riemann's condition Periodic
12)	If $\sum x_i = 21$, $\sum y_i = -7$, $n = 7$ and b_{yx} is	= 3	then the regression line of y on x
	a) $x + 3y = 10$ c) $3x - y = 10$	b) d)	$\begin{aligned} x - 3y &= 6\\ 3x - y &= 70 \end{aligned}$
13)	A continuous random variable has the function $f(x) = kx^2$, $0 \le x \le 2$ then a) $\frac{8}{2}$	he fo k = b)	bllowing probability density $\frac{3}{2}$.
	c) $\frac{3}{2}$	d)	8 2
14)	 lf two regression coefficients are -0. a) -0.3 c) 0.09 	1 an b) d)	d -0.9, then the value of r is 0.3 -0.03

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three.

- **a)** Solve: $(D^2 + a^2)y = \sin ax$
- **b)** Solve: $(D^2 1)y = x \sin 3x + \cos x$
- **c)** Solve: $p^2 pq = 1 z^2$
- d) Find the inverse Laplace transform of the following by using convolution theorem $\frac{1}{s^2(s+1)^2}$
- e) Find Laplace transform of the following

$$\int_{0}^{t} \frac{e^{-u} \sin u}{u} du$$

Q.3 Attempt any three.

- a) Solve: $(D^2 + 3D + 2)y = \sin(e^x)$
- **b)** Solve: $(D^2 + 5D + 4)y = 3 2x$
- c) Solve: $(1+2x)^2 \frac{d^2y}{dx^2} 6(1+2x)\frac{dy}{dx} + 16y = 8(1+2x)^2$ d) Solve: $x(y^2 z^2)p + y(z^2 x^2)q z(x^2 y^2) = 0$
- e) Find $L\{t(2\sin 3t 3\cos 3t)\}$

Attempt any two. Q.4

- The deflection of a struct with one end built-in and other supported and a) subjected to end - thrust P satisfies the equation $\frac{dy^2}{dx^2} + a^2y = \frac{a^2R}{P}(\ell - x)$ Given that dy/dx = 0, y = 0 when x = 0 and y = 0 when $n = \ell$ prove that $y = \frac{R}{P} \left[\frac{\sin ax}{a} - \ell \cos ax + \ell - x \right]$ where $a\ell = \tan a\ell$ and ℓ is the length of struct.
- b) Solve the following equations by the method of separation of variables $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$ where $u(0, y) = 8e^{-3y}$
- c) Using Laplace transformation solve the following differential equation. $(D^{2} + 9)y = 18t, y(0) = 0, y'(0) = 0.$

Section – II

Q.5 Attempt any three of the following.

a) Fit a Binominal distribution to the following data

x_i	0	1	2	3	4
f(x)	30	62	46	10	2

Max. Marks: 56

09

09

10

- b) The size of hats is normally distributed with mean of 18.5 cms and standard deviation of 2.5 cms. How many hats in a total of 2000 will have sizes between
 - 1) 18 cms and 20 cms
 - 2) above 20 cms

[Given: For S.N.V,Z area between z = 0 and z = 0.6 is 0.2257 and that between z = 0 and z = 0.2 is 0.0793]

- $\int \frac{e^z}{(z-1)(z-4)} dz \quad \text{where c is the circle } |z| = 2$ c) Evaluate
- by using Cauchy's Integral formula.
- d) Find half range cosine series for

$$f(x) = 1, \quad 0 \le x \le 1$$

= x, $1 \le x \le 2$

e) Fit a second degree Parabola to the following data

x	0	1	2	3	4
у	1	1.8	1.3	2.5	6.3

Q.6 Attempt any three of the following.

a) Find the Fourier series of

$$f(x) = x^3, \quad -\pi < x < \pi$$

- b) If the probability that an individual suffers a bad reaction due to a certain injection is 0.001, determine the probability that out of 2000 individuals 1) exactly 4
 - 2) more than 2 dindividuals will suffer a bad reaction
- c) From 10 pairs of observations for x and y the following data is obtained : $n = 10, \Sigma x = 66, \Sigma y = 69, \Sigma x^2 = 476, \Sigma y^2 = 521, \Sigma xy = 485$. It was later found that two pairs of (correct) values.

were (wrongly) copied as	2	
	7	

r

y 3

5

Calculate correct value of the correlation coefficient.

- d) The equations of two regression lines obtained in a correlation analysis are 3x + 12y = 19, 3y + 9x = 16. Find
 - 1) mean values of x & y
 - 2) coefficient of correlation
- e) If f(z) = u + iv is analytic and $u v = e^x(\cos y \sin y)$, find f(z) in terms of z.

Attempt any two of the following. Q.7

- **a)** Find the Fourier series expansion for $f(x) = x + \frac{x^2}{4}$, $-\pi < x < \pi$
- b) Find the coefficient of correlation and the equations of lines of regression to the following data.

		x	5	7	8	10	11	13	16
		у	33	30	28	20	18	16	9
c)	Evaluate	$\int_{0}^{1+i} (x^2$	– iy)a	lz,	along t	he pati	h		
	1) $y = x^{2}$	x		2)	$y = x^2$				

09

10

SLR-FM-22





Day & Date: Thursday,28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Answer Book page No.3. Each questions carries one mark.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

1) Polar form of C-R equation are ____

1)	a) $\frac{\partial u}{\partial \theta} = \frac{1}{r} \frac{\partial v}{\partial r}, \frac{\partial u}{\partial r} = r \frac{\partial v}{\partial \theta}$	b) $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$	
	c) $\frac{\partial u}{\partial r} = r \frac{\partial v}{\partial r}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$	d) None of these	
2)	$\int_{c} \frac{z+10}{z^2-4} dz$ Where C is the circle	z = 1 is	
	 a) 2π c) 2πi 	b) -2π d) 0	
3)	The Fourier expansion is the interval $f(x) = -x, -4 \le x \le 0$ $= x 0 \le x \le 4$ has	al [-4, 4] of the function	
	a) No sine termsc) Both cosine & sine terms	b) No cosine termsd) None of these	
4)	The conditions for expansion of a fu a) Harmonic c) Dirichlets condition	 Inction in Fourier series are known as b) Riemann's condition d) Periodic 	
5)	If $\sum x_i = 21$, $\sum y_i = -7$, $n = 7$ and b_{yx} is	= 3 then the regression line of y on x	
	a) $x + 3y = 10$ c) $3x - y = 10$	b) $x - 3y = 6$ d) $3x - y = 70$	
6)	A continuous random variable has t function $f(x) = kx^2, 0 \le x \le 2$ then a) $\frac{8}{3}$	he following probability density $k = \frac{1}{\frac{3}{8}}$	
	c) $\frac{3}{2}$	d) $\frac{2}{3}$	
7)	If two regression coefficients are -0 a) -0.3 c) 0.09	.1 and -0.9, then the value of r is b) 0.3 d) -0.03	

Max. Marks: 70

Marks: 14

Set Q

Seat No.

Set Q

8) The P.I. of
$$X = x. V$$
, where V is a function of x is _______
a) $\left[x + \frac{f'(D)}{f(D)}\right] \frac{1}{f(D)} V$ b) $\left[x - \frac{1}{f(D)}f^{-1}(D)\right] \frac{1}{f(D)} V$
c) $\left[x - \frac{f'(D)}{f^{+}(D)}\right] \frac{1}{f(D)} V$ d) $\left[x + \frac{1}{h^{+}(D)}f(D)\right] \frac{1}{f(D)} V$
9) The general solution of $(D^4 + 6D^2 + 9)y = 0$ is _______.
a) $y = (C_1 + C_2x) \cos \sqrt{3}x + (C_3 + C_4x) \sin \sqrt{3}x$
b) $y = (C_1 + C_2x) e^x + (C_3 + C_4x) e^{-x}$
c) $y = (C_1 + C_2) e^{-x} + (C_3 + C_4x) e^{-x}$
d) $y = (C_1 + C_2 \cos x) e^x + (C_3 + C_4 \sin x) e^x$
10) On putting log $(5 + 2x) = Z$ the differential equation
 $(5 + 2x) \frac{d^2y}{dx^2} - 6(5 + 2x) \frac{dy}{dx} + 8y = 6x$ is transformed to _______.
a) $(D^2 + 4D + 2)y = \frac{3}{4}(e^z - 5)$ b) $(D^2 + 4D + 4)y = \frac{3}{4}(e^z - 5)$
c) $(D^2 - 4D + 2)y = \frac{3}{4}(e^z - 5)$ d) $(D^2 - 4D + 2)y = 3(e^z - 5)$
11) The solution of equation $p + q = pq$ is _______.
a) $z = ax + (a + 1)y + c$
b) $z = (a + 1)x + a(a - 1)y + c$
c) $z = (a - 1)x + a(a + 1)y + c$
d) $z(a - 1) = a(a - 1)x + ay + c$
12) The solution of the equation $(mz - ny)p + (nx - lz)q = ly - mx$ is _______.
a) $\phi (\ell x - my + nz, x^2 + y^2 + z^2) = 0$
b) $\phi (\ell x - my + nz, x^2 + y^2 + z^2) = 0$
c) $\phi (\ell x + my + nz, x^2 + y^2 + z^2) = 0$
d) $\phi (\ell x + my + nz, x^2 - y^2 + z^2) = 0$
13) If $L\{f_1(u)f_2(t - u)du$ b) $\int_0^t f_1(u)f_2(t - u)du$
c) $\int_0^t f_1(u)f_2(t - u)du$ d) None of these
14) The value of integral $\int_0^\infty t^5 e^{-3t} dt$ is ______.
a) $\frac{1}{243}$ b) $\frac{40}{243}$
c) $\frac{4}{243}$ d) $\frac{80}{243}$

09

SLR-FM-22

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three.

- **a)** Solve: $(D^2 + a^2)y = \sin ax$
- **b)** Solve: $(D^2 1)y = x \sin 3x + \cos x$
- **c)** Solve: $p^2 pq = 1 z^2$
- d) Find the inverse Laplace transform of the following by using convolution theorem $\frac{1}{s^2(s+1)^2}$
- e) Find Laplace transform of the following

$$\int_{0}^{l} \frac{e^{-u} \sin u}{u} du$$

Q.3 Attempt any three.

- a) Solve: $(D^2 + 3D + 2)y = \sin(e^x)$
- **b)** Solve: $(D^2 + 5D + 4)y = 3 2x$
- c) Solve: $(1+2x)^2 \frac{d^2y}{dx^2} 6(1+2x)\frac{dy}{dx} + 16y = 8(1+2x)^2$ d) Solve: $x(y^2 z^2)p + y(z^2 x^2)q z(x^2 y^2) = 0$
- e) Find $L\{t(2\sin 3t 3\cos 3t)\}$

Attempt any two. Q.4

- The deflection of a struct with one end built-in and other supported and a) subjected to end - thrust P satisfies the equation $\frac{dy^2}{dx^2} + a^2y = \frac{a^2R}{P}(\ell - x)$ Given that dy/dx = 0, y = 0 when x = 0 and y = 0 when $n = \ell$ prove that $y = \frac{R}{P} \left[\frac{\sin ax}{a} - \ell \cos ax + \ell - x \right]$ where $a\ell = \tan a\ell$ and ℓ is the length of struct.
- b) Solve the following equations by the method of separation of variables $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$ where $u(0, y) = 8e^{-3y}$
- c) Using Laplace transformation solve the following differential equation. $(D^{2} + 9)y = 18t, y(0) = 0, y'(0) = 0.$

Section – II

Q.5 Attempt any three of the following.

a) Fit a Binominal distribution to the following data

x_i	0	1	2	3	4
f(x)	30	62	46	10	2

Max. Marks: 56

09

09

- **b)** The size of hats is normally distributed with mean of 18.5 cms and standard deviation of 2.5 cms. How many hats in a total of 2000 will have sizes between
 - 1) 18 cms and 20 cms
 - 2) above 20 cms

[Given: For S.N.V,Z area between z = 0 and z = 0.6 is 0.2257 and that between z = 0 and z = 0.2 is 0.0793]

- c) Evaluate $\int_{c} \frac{e^{z}}{(z-1)(z-4)} dz$ where c is the circle |z| = 2
- by using Cauchy's Integral formula.
- d) Find half range cosine series for

$$f(x) = 1, \quad 0 \le x \le 1$$

= x, $1 \le x \le 2$

e) Fit a second degree Parabola to the following data

x	0	1	2	3	4	
у	1	1.8	1.3	2.5	6.3	

Q.6 Attempt any three of the following.

- a) Find the Fourier series of
 - $f(x) = x^3, \quad -\pi < x < \pi$
- b) If the probability that an individual suffers a bad reaction due to a certain injection is 0.001, determine the probability that out of 2000 individuals
 1) exactly 4
 - 2) more than 2 dindividuals will suffer a bad reaction
- **c)** From 10 pairs of observations for x and y the following data is obtained : n = 10, $\sum x = 66$, $\sum y = 69$, $\sum x^2 = 476$, $\sum y^2 = 521$, $\sum xy = 485$. It was later found that two pairs of (correct) values.

	x	
were (wrongly) copied as	2	
	7	

3

Calculate correct value of the correlation coefficient.

- d) The equations of two regression lines obtained in a correlation analysis are 3x + 12y = 19, 3y + 9x = 16. Find
 - 1) mean values of x & y
 - 2) coefficient of correlation
- e) If f(z) = u + iv is analytic and $u v = e^x(\cos y \sin y)$, find f(z) in terms of z.

Q.7 Attempt any two of the following.

- **a)** Find the Fourier series expansion for $f(x) = x + \frac{x^2}{4}$, $-\pi < x < \pi$
- **b)** Find the coefficient of correlation and the equations of lines of regression to the following data.

		x	5	7	8	10	11	13	16
		у	33	30	28	20	18	16	9
c)	Evaluate	$\int_{0}^{1+i} (x^2$	– iy)a	lz,	along t	he patl	h		
	1) $y = x^{2}$	x		2)	$y = x^2$				

09

10



Set

Max. Marks: 70

Marks: 14

SLR-FM-22

Page 9 of 16

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Figures to the right indicate full marks.
- 3) Answer Book page No.3. Each guestions carries one mark.

MCQ/Objective Type Questions

Duration: 30 Minutes

2)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The solution of the equation (mz - ny)p + (nx - lz)q = ly - mx is _____.
 - a) $\phi(\ell x + my + nz, x^2 + y^2 + z^2) = 0$ b) $\phi(\ell x my + nz, x^2 + y^2 + z^2) = 0$ c) $\phi(\ell x + my + nz, x^2 + y^2 - z^2) = 0$ d) $\phi(\ell x + mv + nz, x^2 - v^2 + z^2) = 0$ If $L\{f_1(t)\} = \phi_1(s)$ and $L\{f_2(t)\} = \phi_2(s)$, then $L^{-1}\{\phi_1(s)^*\phi_2(s)\} =$ _____. a) $\int_{0}^{1} f_{1}(u)f_{2}(t-u)du$ b) $\int_{0}^{t} f_{1}(t)f_{2}(t-u)du$ c) $\int_{0}^{t} f_{1}(u)f_{2}(t-u)du$ d) None of these

The value of integral $\int_{0}^{\infty} t^5 e^{-3t} dt$ is _____. b) $\frac{40}{243}$ 3) b) $\frac{40}{243}$ $\frac{1}{243}$ C) $\frac{4}{242}$ d) $\frac{80}{242}$ Polar form of C-R equation are ____ 4) a) $\frac{\partial u}{\partial \theta} = \frac{1}{r} \frac{\partial v}{\partial r}, \frac{\partial u}{\partial r} = r \frac{\partial v}{\partial \theta}$ b) $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}, \frac{\partial u}{\partial \theta}$ c) $\frac{\partial u}{\partial r} = r \frac{\partial v}{\partial r}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ d) None of these **b)** $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ c) $\frac{\partial u}{\partial r} = r \frac{\partial v}{\partial r}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ $\int \frac{z+10}{z^2-4} dz$ Where C is the circle |z| = 1 is _____. 5) a) 2π b) -2π d) 0 c) $2\pi i$ The Fourier expansion is the interval [-4, 4] of the function 6) $f(x) = -x, \quad -4 \le x \le 0$ has = x $0 \le x \le 4$ No sine terms b) No cosine terms a)

Both cosine & sine terms d) None of these C)



Seat	
No.	

Set | R 7) The conditions for expansion of a function in Fourier series are known as ____. a) Harmonic b) Riemann's condition c) Dirichlets condition d) Periodic 8) If $\sum x_i = 21$, $\sum y_i = -7$, n = 7 and $b_{yx} = 3$ then the regression line of y on x is a) x + 3y = 10b) x - 3y = 6d) 3x - v = 70c) 3x - y = 10A continuous random variable has the following probability density 9) function $f(x) = kx^2$, $0 \le x \le 2$ then k =a) b) 3 8 d) $\frac{2}{3}$ 3 c) If two regression coefficients are -0.1 and -0.9, then the value of r is _____. 10) a) -0.3 b) 0.3 c) 0.09 d) -0.03 The P.I. of X = x.V, where V is a function of x is _____. a) $\left[x + \frac{f^1(D)}{f(D)}\right] \frac{1}{f(D)}V$ b) $\left[x - \frac{1}{f(D)}f^1(D)\right] \frac{1}{f(D)}V$ 11)d) $\left[x + \frac{1}{f^{1}(D)}f(D)\right] \frac{1}{f(D)}V$ c) $\left[x - \frac{f(D)}{f^{1}(D)} \right] \frac{1}{f(D)} V$ The general solution of $(D^4 + 6D^2 + 9)y = 0$ is _____. 12) a) $y = (C_1 + C_2 x) \cos \sqrt{3}x + (C_3 + C_4 x) \sin \sqrt{3}x$ b) $y = (C_1 + C_2 x)e^x + (C_3 + C_4 x)e^{-x}$ c) $y = (C_1 + C_2)e^{-x} + (C_3 + C_4 x)e^x$ d) $y = (C_1 + C_2 \cos x)e^x + (C_3 + C_4 \sin x)e^x$ On putting log(5 + 2x) = Z the differential equation 13) $(5+2x)\frac{d^2y}{dx^2} - 6(5+2x)\frac{dy}{dx} + 8y = 6x \text{ is transformed to} ____.$ a) $(D^2 + 4D + 2)y = \frac{3}{4}(e^z - 5)$ b) $(D^2 + 4D + 4)y = \frac{3}{4}(e^z - 5)$ c) $(D^2 - 4D + 2)y = \frac{3}{4}(e^z - 5)$ d) $(D^2 - 4D + 2)y = 3(e^z - 5)$ 14) The solution of equation p + q = pq is _____. a) z = ax + (a + 1)y + cb) z = (a + 1)x + a(a - 1)y + cc) z = (a-1)x + a(a+1)y + c

d) z(a-1) = a(a-1)x + ay + c

SLR-FM-22

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three.

- **a)** Solve: $(D^2 + a^2)y = \sin ax$
- **b)** Solve: $(D^2 1)y = x \sin 3x + \cos x$
- **c)** Solve: $p^2 pq = 1 z^2$
- d) Find the inverse Laplace transform of the following by using convolution theorem $\frac{1}{s^2(s+1)^2}$
- e) Find Laplace transform of the following

$$\int_{0}^{l} \frac{e^{-u} \sin u}{u} du$$

Q.3 Attempt any three.

- a) Solve: $(D^2 + 3D + 2)y = \sin(e^x)$
- **b)** Solve: $(D^2 + 5D + 4)y = 3 2x$
- c) Solve: $(1+2x)^2 \frac{d^2y}{dx^2} 6(1+2x)\frac{dy}{dx} + 16y = 8(1+2x)^2$ d) Solve: $x(y^2 z^2)p + y(z^2 x^2)q z(x^2 y^2) = 0$
- e) Find $L\{t(2\sin 3t 3\cos 3t)\}$

Attempt any two. Q.4

- The deflection of a struct with one end built-in and other supported and a) subjected to end - thrust P satisfies the equation $\frac{dy^2}{dx^2} + a^2y = \frac{a^2R}{P}(\ell - x)$ Given that dy/dx = 0, y = 0 when x = 0 and y = 0 when $n = \ell$ prove that $y = \frac{R}{P} \left[\frac{\sin ax}{a} - \ell \cos ax + \ell - x \right]$ where $a\ell = \tan a\ell$ and ℓ is the length of struct.
- b) Solve the following equations by the method of separation of variables $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$ where $u(0, y) = 8e^{-3y}$
- c) Using Laplace transformation solve the following differential equation. $(D^{2} + 9)y = 18t, y(0) = 0, y'(0) = 0.$

Section – II

Q.5 Attempt any three of the following.

a) Fit a Binominal distribution to the following data

x_i	0	1	2	3	4
f(x)	30	62	46	10	2

Max. Marks: 56

10

09

09

- b) The size of hats is normally distributed with mean of 18.5 cms and standard deviation of 2.5 cms. How many hats in a total of 2000 will have sizes between
 - 1) 18 cms and 20 cms
 - 2) above 20 cms

[Given: For S.N.V,Z area between z = 0 and z = 0.6 is 0.2257 and that between z = 0 and z = 0.2 is 0.0793]

- $\int \frac{e^z}{(z-1)(z-4)} dz \quad \text{where c is the circle } |z| = 2$ c) Evaluate
- by using Cauchy's Integral formula.
- d) Find half range cosine series for

$$f(x) = 1, \quad 0 \le x \le 1$$

= x, $1 \le x \le 2$

e) Fit a second degree Parabola to the following data

x	0	1	2	3	4
у	1	1.8	1.3	2.5	6.3

Q.6 Attempt any three of the following.

a) Find the Fourier series of

$$f(x) = x^3, \quad -\pi < x < \pi$$

- b) If the probability that an individual suffers a bad reaction due to a certain injection is 0.001, determine the probability that out of 2000 individuals 1) exactly 4
 - 2) more than 2 dindividuals will suffer a bad reaction
- c) From 10 pairs of observations for x and y the following data is obtained : $n = 10, \Sigma x = 66, \Sigma y = 69, \Sigma x^2 = 476, \Sigma y^2 = 521, \Sigma xy = 485$. It was later found that two pairs of (correct) values.

х

2

3

0)						
Calcul	ate c	orrect	value	of the	correlation	coefficient.	

were (wrongly) copied as

- d) The equations of two regression lines obtained in a correlation analysis are 3x + 12y = 19, 3y + 9x = 16. Find
 - 1) mean values of x & y
 - 2) coefficient of correlation
- e) If f(z) = u + iv is analytic and $u v = e^{x}(\cos y \sin y)$, find f(z) in terms of z.

Attempt any two of the following. Q.7

- **a)** Find the Fourier series expansion for $f(x) = x + \frac{x^2}{4}$, $-\pi < x < \pi$
- b) Find the coefficient of correlation and the equations of lines of regression to the following data.

		x	5	7	8	10	11	13	16
		у	33	30	28	20	18	16	9
c)	Evaluate	$\int^{1+i} (x^2$	– iy)a	lz,	along t	he patl	h		
	1) $y = x^{2}$	0 X		2)	$y = x^2$				

09

SLR-FM-22

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 Civil Engineering

Day & Date: Thursday,28-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

ENGINEERING MATHEMATICS – III

- 2) Figures to the right indicate full marks.
- 3) Answer Book page No.3. Each questions carries one mark.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The Fourier expansion is the interval [-4, 4] of the function
 - $f(x) = -x, \quad -4 \le x \le 0$ has _____.
 - $= x \quad 0 \le x \le 4$
 - a) No sine terms b) No cosine terms
 - c) Both cosine & sine terms d) None of these
- 2) The conditions for expansion of a function in Fourier series are known as _____.
 - a) Harmonic b) Riemann's condition c) Dirichlets condition d) Periodic
- 3) If $\sum x_i = 21$, $\sum y_i = -7$, n = 7 and $b_{yx} = 3$ then the regression line of y on x is
 - a) x + 3y = 10b) x - 3y = 6c) 3x - y = 10d) 3x - y = 70
- 4) A continuous random variable has the following probability density function $f(x) = kx^2$, $0 \le x \le 2$ then k =_____. a) $\frac{8}{2}$ b) $\frac{3}{2}$.
 - $\frac{\alpha}{3}$

C) $\frac{3}{2}$

5) If two regression coefficients are -0.1 and -0.9, then the value of r is ____. a) -0.3 b) 0.3

8

d)

- c) 0.09 d) -0.03
- 6) The P.I. of X = x.V, where V is a function of x is _____. a) $\left[x + \frac{f^{1}(D)}{f(D)}\right] \frac{1}{f(D)}V$ b) $\left[x - \frac{1}{f(D)}f^{1}(D)\right] \frac{1}{f(D)}V$ c) $\left[x - \frac{f(D)}{f^{1}(D)}\right] \frac{1}{f(D)}V$ d) $\left[x + \frac{1}{f^{1}(D)}f(D)\right] \frac{1}{f(D)}V$

7) The general solution of
$$(D^4 + 6D^2 + 9)y = 0$$
 is _____

- a) $y = (C_1 + C_2 x) \cos \sqrt{3}x + (C_3 + C_4 x) \sin \sqrt{3}x$
- b) $y = (C_1 + C_2 x)e^x + (C_3 + C_{4x})e^{-x}$
- c) $y = (C_1 + C_2)e^{-x} + (C_3 + C_4x)e^x$
- d) $y = (C_1 + C_2 \cos x)e^x + (C_3 + C_4 \sin x)e^x$

Max. Marks: 70

Marks: 14

SLR-FM-22

Set

Set S 8) On putting log(5 + 2x) = Z the differential equation $(5+2x)\frac{d^2y}{dx^2} - 6(5+2x)\frac{dy}{dx} + 8y = 6x \text{ is transformed to } ____.$ a) $(D^2 + 4D + 2)y = \frac{3}{4}(e^z - 5)$ b) $(D^2 + 4D + 4)y = \frac{3}{4}(e^z - 5)$ c) $(D^2 - 4D + 2)y = \frac{3}{4}(e^z - 5)$ d) $(D^2 - 4D + 2)y = 3(e^z - 5)$ 9) The solution of equation p + q = pq is _____. a) z = ax + (a + 1)y + cb) z = (a + 1)x + a(a - 1)y + cc) z = (a-1)x + a(a+1)y + cd) z(a-1) = a(a-1)x + ay + c10) The solution of the equation (mz - ny)p + (nx - lz)q = ly - mx is _____. a) $\phi(\ell x + my + nz, x^2 + y^2 + z^2) = 0$ b) $\phi(\ell x - my + nz, x^2 + y^2 + z^2) = 0$ c) $\phi(\ell x + my + nz, x^2 + y^2 - z^2) = 0$ d) $\phi(\ell x + my + nz, x^2 - y^2 + z^2) = 0$ If $L\{f_1(t)\} = \phi_1(s)$ and $L\{f_2(t)\} = \phi_2(s)$, then $L^{-1}\{\phi_1(s)^*\phi_2(s)\} =$ _____. 11) a) $\int_{0}^{1} f_{1}(u)f_{2}(t-u)du$ b) $\int_{0}^{t} f_{1}(t)f_{2}(t-u)du$ c) $\int_{0}^{t} f_{1}(u)f_{2}(t-u)du$ d) None of these The value of integral $\int_{0}^{\infty} t^{5}e^{-3t}dt$ is _____. a) $\frac{1}{\frac{243}{4}}$ b) $\frac{40}{\frac{243}{243}}$ b) $\frac{80}{\frac{243}{243}}$ 12) Polar form of C-R equation are _____. a) $\frac{\partial u}{\partial \theta} = \frac{1}{r} \frac{\partial v}{\partial r}, \frac{\partial u}{\partial r} = r \frac{\partial v}{\partial \theta}$ b) $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ c) $\frac{\partial u}{\partial r} = r \frac{\partial v}{\partial r}, \frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ d) None of these 13) 14) $\int \frac{z+10}{z^2-4} dz$ Where C is the circle |z| = 1 is _____. a) 2π b) -2π c) 2πi d) 0

SLR-FM-22

Seat	
No.	

S.E. (Part – II) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three.

- **a)** Solve: $(D^2 + a^2)y = \sin ax$
- **b)** Solve: $(D^2 1)y = x \sin 3x + \cos x$
- **c)** Solve: $p^2 pq = 1 z^2$
- d) Find the inverse Laplace transform of the following by using convolution theorem $\frac{1}{s^2(s+1)^2}$
- e) Find Laplace transform of the following

$$\int_{0}^{l} \frac{e^{-u} \sin u}{u} du$$

Q.3 Attempt any three.

- a) Solve: $(D^2 + 3D + 2)y = \sin(e^x)$
- **b)** Solve: $(D^2 + 5D + 4)y = 3 2x$
- c) Solve: $(1+2x)^2 \frac{d^2y}{dx^2} 6(1+2x)\frac{dy}{dx} + 16y = 8(1+2x)^2$ d) Solve: $x(y^2 z^2)p + y(z^2 x^2)q z(x^2 y^2) = 0$
- e) Find $L\{t(2\sin 3t 3\cos 3t)\}$

Attempt any two. Q.4

- The deflection of a struct with one end built-in and other supported and a) subjected to end - thrust P satisfies the equation $\frac{dy^2}{dx^2} + a^2y = \frac{a^2R}{P}(\ell - x)$ Given that dy/dx = 0, y = 0 when x = 0 and y = 0 when $n = \ell$ prove that $y = \frac{R}{P} \left[\frac{\sin ax}{a} - \ell \cos ax + \ell - x \right]$ where $a\ell = \tan a\ell$ and ℓ is the length of struct.
- b) Solve the following equations by the method of separation of variables $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$ where $u(0, y) = 8e^{-3y}$
- c) Using Laplace transformation solve the following differential equation. $(D^{2} + 9)y = 18t, y(0) = 0, y'(0) = 0.$

Section – II

Q.5 Attempt any three of the following.

a) Fit a Binominal distribution to the following data

x_i	0	1	2	3	4
f(x)	30	62	46	10	2

Max. Marks: 56

09

09

10

- b) The size of hats is normally distributed with mean of 18.5 cms and standard deviation of 2.5 cms. How many hats in a total of 2000 will have sizes between
 - 1) 18 cms and 20 cms
 - 2) above 20 cms

[Given: For S.N.V,Z area between z = 0 and z = 0.6 is 0.2257 and that between z = 0 and z = 0.2 is 0.0793]

- $\int \frac{e^z}{(z-1)(z-4)} dz \quad \text{where c is the circle } |z| = 2$ c) Evaluate
- by using Cauchy's Integral formula.
- d) Find half range cosine series for

$$f(x) = 1, \quad 0 \le x \le 1$$

= x, $1 \le x \le 2$

e) Fit a second degree Parabola to the following data

x	0	1	2	3	4
у	1	1.8	1.3	2.5	6.3

Q.6 Attempt any three of the following.

a) Find the Fourier series of

$$f(x) = x^3, \quad -\pi < x < \pi$$

- b) If the probability that an individual suffers a bad reaction due to a certain injection is 0.001, determine the probability that out of 2000 individuals 1) exactly 4
 - 2) more than 2 dindividuals will suffer a bad reaction
- c) From 10 pairs of observations for x and y the following data is obtained : $n = 10, \Sigma x = 66, \Sigma y = 69, \Sigma x^2 = 476, \Sigma y^2 = 521, \Sigma xy = 485$. It was later found that two pairs of (correct) values.

х

2

3 5

•	•							
Calcul	ate c	orrect	value	of the	correlation	coeff	icient	

were (wrongly) copied as

- d) The equations of two regression lines obtained in a correlation analysis are 3x + 12y = 19, 3y + 9x = 16. Find
 - 1) mean values of x & y
 - 2) coefficient of correlation
- e) If f(z) = u + iv is analytic and $u v = e^{x}(\cos y \sin y)$, find f(z) in terms of z.

Attempt any two of the following. Q.7

- **a)** Find the Fourier series expansion for $f(x) = x + \frac{x^2}{4}$, $-\pi < x < \pi$
- b) Find the coefficient of correlation and the equations of lines of regression to the following data.

		x	5	7	8	10	11	13	16
		у	33	30	28	20	18	16	9
c)	Evaluate	lz,	along t	he patl	h				
	1) $y = x^{0}$ 2)				$y = x^2$				

09



Day & Date: Friday, 06-12-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 3) Use of scientific non programmable calculator is allowed.
- 4) Figures to the right indicate full marks.
- 5) Assume suitable data if necessary and mention it clearly before the Solution.
- 6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

The collapse load for a cantilever beam of span I subjected to uniformly 1) distributed load is .

b)

7.67 Mp/I

- a) 0.414 Mp/I C)
 - 11.656 Mp/I none of the above d)
- 2) The thickness of base plate s determined from the .
 - flexural strength of the plate a)
 - shear strength of plate b)
 - bearing strength of concrete pedestal c)
 - punching criteria d)
- 3) The best arrangement to provide unified behavior in built up steel column is by
 - lacing a)
 - b) battening perforated cover plates tie plates d) c)
- The partial safety factors for dead load and live load for a roof truss for 4) limit state of serviceability respectively
 - 1.2 and 1.0 1 and 1.5 b) a)
 - c) 1.2 and 1.5 1.0 and 1.0 d)

The economical spacing of a roof truss depends upon the . 5)

- cost of purlin and cost of roof covering a)
- cost of roof covering and dead load of the roof truss b)
- dead load and live loads C)
- live loads and cost of purlin d)
- A gusset plate is subjected to 6)
 - a) direct stress b) shear stress all of the above
 - bending stress C) d)
- A beam section is selected and provided on the basis of 7)
 - section modulus deflection a) b) all of the above
 - c) shear d)

Marks: 14

SLR-FM-23

Set

Max. Marks: 70

Seat

No.

Set 8) The shear lag effect in beam flanges are disregarded when the outstand of the beam flange is less than or equal to Lo/10 Lo/15 a) b) C) Lo/20 d) Lo 9) Battening is preferred when the _ column carries axial load only a) space between two main components is not very large b) both a & b C) none of the above d) 10) The thickness of double flat lacing should not be less than _____. 1/30th length between inner rivets a) 1/40th length between inner rivets b) 1/50th length between inner rivets c) 1/60th length between inner rivets d) 11) The number of possible plastic hinges for a propped cantilever beam is _____. 1 a) 2 b) C) 3 d) zero 12) The length of the plastic hinge for a simply supported beam of span L subjected to a central point load is of rectangular section. L/3 2L/3a) b) c) L/2 d) none of the above 13) Design of beam is governed by shear When the depth of the beam section is small a) when the large concentrated loads are placed near beam supports b) both a & b c) none of the above is correct d) 14) The thickness of battens flat should not be less than . 1/30th length between inner line of rivets a) 1/40th length between inner line of rivets b)

- c) 1/50th length between inner line of rivets
- d) $1/60^{\text{th}}$ length between inner line of rivets

SLR-FM-23

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gusset plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- a) Salient features of limit state method of design of steel structures.
- b) Advantages and disadvantages of welded connection over bolted connection.
- c) Behaviour of bolted joints.

Section – II

- Q.6 A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mmc/c spacing of beams = 3mImposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.

Seat

No.

SLR-FM-23

Max. Marks: 56



SLR-FM-23 Set P

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

Day & Date: Friday, 06-12-2019

Time: 02:30 PM To 06:30 PM

- **Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
 - 3) Use of scientific non programmable calculator is allowed.
 - 4) Figures to the right indicate full marks.
 - 5) Assume suitable data if necessary and mention it clearly before the Solution.

6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The shear lag effect in beam flanges are disregarded when the outstand of the beam flange is less than or equal to _____.
 - a) Lo/10 b) Lo/15
 - c) Lo/20 d) Lo
- 2) Battening is preferred when the ____
 - a) column carries axial load only
 - b) space between two main components is not very large
 - c) both a & b
 - d) none of the above
- 3) The thickness of double flat lacing should not be less than _____.
 - a) 1/30th length between inner rivets
 - b) 1/40th length between inner rivets
 - c) 1/50th length between inner rivets
 - d) 1/60th length between inner rivets

4) The number of possible plastic hinges for a propped cantilever beam is _____.

- a) 2 b) 1
- c) 3 d) zero
- 5) The length of the plastic hinge for a simply supported beam of span L subjected to a central point load is of rectangular section.
 - a) L/3 c) L/2
- b) 2L/3 d) none of the above
- 6) Design of beam is governed by shear ____
 - a) When the depth of the beam section is small
 - b) when the large concentrated loads are placed near beam supports
 - c) both a & b
 - d) none of the above is correct
- 7) The thickness of battens flat should not be less than _____.
 - a) $1/30^{\text{th}}_{\text{d}}$ length between inner line of rivets
 - b) 1/40th length between inner line of rivets
 - c) $1/50^{\text{th}}$ length between inner line of rivets
 - d) 1/60th length between inner line of rivets

SLR-FM-23

Max. Marks: 70

Marks: 14

10 m = - - -

SLR-FM-23 Set Q

- 8) The collapse load for a cantilever beam of span I subjected to uniformly distributed load is _____.
 - a) 0.414 Mp/l

- b) 7.67 Mp/I
- 11.656 Mp/l c)
- d) none of the above

battening

1.2 and 1.0

- 9) The thickness of base plate s determined from the
 - flexural strength of the plate a)
 - b) shear strength of plate
 - C) bearing strength of concrete pedestal
 - punching criteria d)
- 10) The best arrangement to provide unified behavior in built up steel column is by ___

b)

- a) lacing
- C) tie plates d) perforated cover plates
- 11) The partial safety factors for dead load and live load for a roof truss for limit state of serviceability respectively _
 - a) 1 and 1.5 b)
 - c) 1.0 and 1.0 d) 1.2 and 1.5
- 12) The economical spacing of a roof truss depends upon the _____.
 - cost of purlin and cost of roof covering a)
 - b) cost of roof covering and dead load of the roof truss
 - dead load and live loads C)
 - live loads and cost of purlin d)
- A gusset plate is subjected to _____. 13)
 - a) direct stress

- b) shear stress
- d) all of the above
- A beam section is selected and provided on the basis of _____. 14)
 - section modulus a)

bending stress

deflection b)

C) shear

C)

- all of the above d)

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gusset 09 plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre 09 to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored 10 load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- Salient features of limit state method of design of steel structures. a)
- Advantages and disadvantages of welded connection over bolted connection. b)
- c) Behaviour of bolted joints.

Section – II

- A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right Q.6 09 hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mm c/c spacing of beams = 3m Imposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.

Seat

No.

SLR-FM-23

Max. Marks: 56



SLR-FM-23 Set Q

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

Seat No.						Set	R
	ר	Г.Е. (Part	- I) (CBCS) E	xaminati	on Nov/Dec-2019		
		DE	SIGN OF STE	EEL STRU	g JCTURES		
Day & Da Time: 02	ate: Frida :30 PM T	ay, 06-12-20 o 06:30 PM)19 1			Max. Marks	: 70
Instructi	ions: 1) (Q. No. 1 is c	compulsory and	should be s	solved in first 30 minu	tes in answe	r
	2) ((000K. Use of IS 80 (Q_No_1)	00-2007 and IS 8	375 are allo	wed, but not allowed	for MCQ	
	3)	Use of scien	ntific non progra	mmable cal	culator is allowed.		
	4) 1 5) /	Assume suit	table data if nec	essary and	mention it clearly bef	ore the	
	6) I	Draw the ap	propriate sketch	es whenev	er necessary.		
Duration	: 30 Minu	ites		e Type Qu	25110115	Marks	: 14
Q.1 C 1	Choose th) The a) b) c) d)	he correct a economical cost of purl cost of roof dead load a live loads a	alternatives fro I spacing of a ro in and cost of ro covering and de and live loads and cost of purlin	m the opti of truss dep of covering ead load of	ons and rewrite the bends upon the the roof truss	sentence. _·	14
2) A gu a) c)	usset plate is direct stres bending str	s subjected to _ s ress	 b) d)	shear stress all of the above		
3) Abe a) c)	eam section section mo shear	is selected and odulus	provided o b) d)	n the basis of deflection all of the above		
4) The the l a) c)	shear lag e beam flange Lo/10 Lo/20	ffect in beam fla e is less than or	inges are d equal to b) d)	isregarded when the Lo/15 Lo	outstand of	
5) Batt a) b) c) d)	ening is pre column car space betw both a & b none of the	ferred when the ries axial load o veen two main co above	 nly omponents	is not very large		
6) The a) b) c) d)	thickness o 1/30 th lengt 1/40 th lengt 1/50 th lengt 1/60 th lengt	of double flat laci h between inner h between inner h between inner h between inner	ng should i rivets rivets rivets rivets	not be less than	·	
7) The a) c)	number of 2 3	possible plastic	hinges for a b) d)	a propped cantilever k 1 zero	beam is	
8) The subj a)	length of th ected to a c L/3	e plastic hinge f central point load	or a simply d is of recta b)	supported beam of s ngular section. 2L/3	pan L	

d)

none of the above

C)

L/2

SLR-FM-23

- 9) Design of beam is governed by shear ____
 - When the depth of the beam section is small a)
 - b) when the large concentrated loads are placed near beam supports
 - both a & b c)
 - none of the above is correct d)
- The thickness of battens flat should not be less than _____. 10)
 - 1/30th length between inner line of rivets a)
 - 1/40th length between inner line of rivets b)
 - 1/50th length between inner line of rivets C)
 - 1/60th length between inner line of rivets d)
- The collapse load for a cantilever beam of span I subjected to uniformly 11) distributed load is _____.
 - a) 0.414 Mp/l
- b) 7.67 Mp/I
- 11.656 Mp/I c)
- d) none of the above

Set R

- 12) The thickness of base plate s determined from the _____.
 - flexural strength of the plate a)
 - shear strength of plate b)
 - c) bearing strength of concrete pedestal
 - punching criteria d)
- 13) The best arrangement to provide unified behavior in built up steel column is by .
 - a) lacing

- b) battening
- C) tie plates d) perforated cover plates
- The partial safety factors for dead load and live load for a roof truss for 14) limit state of serviceability respectively ____
 - a) 1 and 1.5
- 1.2 and 1.0 b)

1.0 and 1.0 c)

1.2 and 1.5 d)

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gusset 09 plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre 09 to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- 10 Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- Salient features of limit state method of design of steel structures. a)
- Advantages and disadvantages of welded connection over bolted connection. b)
- c) Behaviour of bolted joints.

Section – II

- A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right Q.6 09 hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mm c/c spacing of beams = 3m Imposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.





Set

Max. Marks: 56

SLR-FM-23 Set R

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

Day & Date: Friday, 06-12-2019

Time: 02:30 PM To 06:30 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
 - 3) Use of scientific non programmable calculator is allowed.
 - 4) Figures to the right indicate full marks.
 - 5) Assume suitable data if necessary and mention it clearly before the Solution.
 - 6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The thickness of double flat lacing should not be less than .
 - 1/30th length between inner rivets a)
 - 1/40th length between inner rivets b)
 - 1/50th length between inner rivets c)
 - 1/60th length between inner rivets d)
- The number of possible plastic hinges for a propped cantilever beam is . 2)
 - a) 2 b) 1
 - c) d) 3 zero
- 3) The length of the plastic hinge for a simply supported beam of span L subjected to a central point load is of rectangular section.
 - a) L/3

- 2L/3 b)
- c) L/2 d) none of the above
- 4) Design of beam is governed by shear _
 - a) When the depth of the beam section is small
 - when the large concentrated loads are placed near beam supports b)
 - both a & b c)
 - none of the above is correct d)
- 5) The thickness of battens flat should not be less than _____.
 - 1/30th length between inner line of rivets a)
 - 1/40th length between inner line of rivets b)
 - 1/50th length between inner line of rivets C)
 - 1/60th length between inner line of rivets d)
- 6) The collapse load for a cantilever beam of span I subjected to uniformly distributed load is .
 - a) 0.414 Mp/l

- b) 7.67 Mp/I d) none of the above
- c) 11.656 Mp/l
- 7) The thickness of base plate s determined from the .
 - flexural strength of the plate a)
 - b) shear strength of plate
 - c) bearing strength of concrete pedestal
 - punching criteria d)

SLR-FM-23

Max. Marks: 70

Marks: 14

8) The best arrangement to provide unified behavior in built up steel column is by ___ . a) lacing b) battening perforated cover plates c) tie plates d) The partial safety factors for dead load and live load for a roof truss for 9) limit state of serviceability respectively _ 1 and 1.5 b) 1.2 and 1.0 a) 1.0 and 1.0 d) 1.2 and 1.5 c) The economical spacing of a roof truss depends upon the _____. 10) a) cost of purlin and cost of roof covering cost of roof covering and dead load of the roof truss b) dead load and live loads c) d) live loads and cost of purlin A gusset plate is subjected to _____. 11) a) direct stress b) shear stress bending stress all of the above d) C) A beam section is selected and provided on the basis of _____. 12) a) section modulus b) deflection all of the above shear c) d) 13) The shear lag effect in beam flanges are disregarded when the outstand of the beam flange is less than or equal to Lo/10 a) Lo/15 b) c) Lo/20 d) Lo 14) Battening is preferred when the _ .

- a) column carries axial load only
- b) space between two main components is not very large
- c) both a & b
- d) none of the above

SLR-FM-23 Set S

Page 15 01 10	Page	15	of	16
---------------	------	----	----	----

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Seat

No.

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gusset09 plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- a) Salient features of limit state method of design of steel structures.
- **b)** Advantages and disadvantages of welded connection over bolted connection.
- c) Behaviour of bolted joints.

Section – II

- Q.6 A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mmc/c spacing of beams = 3mImposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.

Max. Marks: 56

SLR-FM-23

Set S



SLR-FM-23 Set S

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

			GEOTECHNICAL EN	GIN	y EERING - I
Day a Time	& Date : 02:3	e: Moi 0 PM	nday, 09-12-2019 To 05:30 PM		Max. Marks: 70
Instr	uctior	1s: 1)	Q. No. 1 is compulsory and shou book.	ıld be	solved in first 30 minutes in answer
		2)	Figures to the right indicate full m	arks.	
-		- - -	MCQ/Objective Typ	e Qu	estions
Dura	tion: 3	0 Min	lutes		Marks: 14
Q.1	Choc 1)	se th If sol poro	ie correct alternatives from the id portion and void portion in a giv sity for this soil is	optio ven m	ass of soil is same then
		a) c)	1 0.50	b) d)	0.75 0.25
	2)	Whic a) c)	ch factors do not affect the permea Shape of soil particle Specific gravity	ability b) d)	of soil Size of soil particle Porosity
	3)	Optin effor a) c)	mum moisture content of which so t Silt Sand	bil is n b) d)	nore at a given compaction Clay Sandy clay
	4)	Whic a) c)	ch roller is most suitable for compa Pneumatic Sheep foot	acting b) d)	clayey soil? Vibratory smooth wheel
	5)	Coef curve a) c)	ficient of volume compressibility i e e - p curve flow curve	s the b) d)	slope of which of following e - log p curve None of these
	6)	lf the a) c)	e soil is dry then percentage air vo 1 0.50	oid for b) d)	this soil is 0 None of these
	7)	Pern a) c)	neability of the soil is more when t 0% 50%	he de b) d)	egree of saturation of soil is 25% 100%
	8)	In co dens	ompaction test graph is plotted ity of soil.	betw	een water content and
		a) c)	Buik Dry	b) d)	Submerged Soil solid

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 Civil Engineering

70

Set P

SLR-FM-24

Seat No.

					SLR-FM-24 Set P
9)	Proc a) c)	ess of removal of water from the compaction compression	soil is b) d)	called consolidation none of these	
10)	Grap a) c)	phical method for finding earth pre Terzaghi Boussinesq	essure b) d)	e is given by Cassagrande Culman	
11)	Vane a) c)	e shear test is commonly used to Clayey Silty	find s b) d)	hear strength of _ Sandy Soft clayey soil	soil.
12)	Heig a) c)	ht of fall of rammer in modified co 250mm 400mm	ompac b) d)	ction test is 310mm 450mm	
13)	Whio a) c)	ch of following shear strength test UU test CD test	is qu b) d)	ick one? CU test None of these	
14)	Stan test a) c)	idard size of soil sample used for is 30mm dia. and 60mm height 50 cm dia and 100 cm length	condu b) d)	ucting unconfined 38mm dia. and 7 10 cm dia and 20	compression 6mm height) cm length

05

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- a) Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- **b)** Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - **b)** A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- **Q.4 a)** What is permeability of soil? Explain any four factors affecting permeability **05** of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?

b) Consolidated undrained test were carried out on a soil sample and 05 following observations were recorded.

Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

SLR-FM-24



Set

.

Max. Marks: 56

80
Section – II

Q.6 Answer any four questions:

- Define Maximum dry density and optimum moisture content. a)
- Define over-consolidation ratio and how it is used to classify the soil. b)
- Draw compaction curve along with zero air void line (label all parts). c)
- Draw typical e p curve and label various parts of it. d)
- Write any four analogy between spring model and saturated soil e) (consolidation).
- Q.7 Explain step wise procedure for field compaction of soil. a)
 - The following are the results of a standard compaction test performed on a b) 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- Plot compaction curve and hence find OMC and MDD 1)
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- Q.8 a) Explain e- log p curve and derive the coefficient associated with it.
 - A clay specimen was tested in a laboratory consolidation device, which 05 b) was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m 1) thickness where only the top layer is drained
 - Time for 90% consolidation in the field with this soil with a 2.5 m 2) thickness where only the top layer is drained
- Q.9 Enlist the assumptions of Rankine's Theory of earth pressure. a)
 - Calculate total active earth pressure and its position with respect to bottom 05 b) of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having $\Upsilon = 18$ kN/m³, c = 0 and $\varphi = 27^{0}$ followed by second layer having $\Upsilon = 19$ kN/m³, c = 0 and $\varphi = 30^{\circ}$.

80

05

SLR-FM-24

Set

05

			Civil Engin GEOTECHNICAL E	eerir NGIN	ng IEERING - I	
Day	& Dat	te: Mo	onday, 09-12-2019		Max. Marks:	70
Inct		30 PIV	1.10.05:30 PM		a colved in first 20 minutes in answ	or
11150	uciio	/// 5 . / <i>)</i>	book.			ei
		2)) Figures to the right indicate full i	marks		
_	_		MCQ/Objective Ty	pe Qı	lestions	
Dura	ation:	30 Mi	nutes		Marks:	. 14
Q.1	Cho 1)	ose t In c den	he correct alternatives from the compaction test graph is plotted sity of soil.	e opti d betv	ons and rewrite the sentence. veen water content and	14
	2)	a) c) Proe	Bulk Dry cess of removal of water from the	b) d) soil is	Submerged Soil solid s called	
		a) c)	compaction compression	b) d)	consolidation none of these	
	3)	Gra a) c)	phical method for finding earth pr Terzaghi Boussinesq	essur b) d)	e is given by Cassagrande Culman	
	4)	Van a) c)	e shear test is commonly used to Clayey Silty	o find s b) d)	shear strength of soil. Sandy Soft clayey soil	
	5)	Heię a) c)	ght of fall of rammer in modified c 250mm 400mm	ompa b) d)	ction test is 310mm 450mm	
	6)	Whi a) c)	ch of following shear strength tes UU test CD test	st is qu b) d)	uick one? CU test None of these	
	7)	Star test a) c)	ndard size of soil sample used for is 30mm dia. and 60mm height 50 cm dia and 100 cm length	r cond b) d)	ucting unconfined compression 38mm dia. and 76mm height 10 cm dia and 20 cm length	
	8)	lf sc porc a) c)	blid portion and void portion in a g osity for this soil is 1 0.50	iven r b) d)	0.75 0.25	
	9)	Whi a) c)	ch factors do not affect the permo Shape of soil particle Specific gravity	eabilit <u>y</u> b) d)	y of soil Size of soil particle Porosity	

Set Q

Seat No.

10) Optimum moisture content of which soil is more at a given compaction effort ____.

Silt a)

Sand

C)

Clay b)

SLR-FM-24

Set | Q

d) Sandy clay

- Which roller is most suitable for compacting clayey soil? 11)
 - a) Pneumatic b) Vibratory
 - d) C) Sheep foot smooth wheel
- Coefficient of volume compressibility is the slope of which of following 12) curve _____.
 - e log p curve a) e - p curve b)
 - d) None of these C) flow curve
- If the soil is dry then percentage air void for this soil is _____. 13)
 - a) 1 b) 0
 - d) C) 0.50 None of these
- Permeability of the soil is more when the degree of saturation of soil is ___. 14)
 - a) 0% b) 25% C)
 - 50%

100% d)

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019

Time: 02:30 PM To 05:30 PM

Seat No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- **a)** Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- **b)** Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - **b)** A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- Q.4 a) What is permeability of soil? Explain any four factors affecting permeability 05 of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?
 - b) Consolidated undrained test were carried out on a soil sample and 05 following observations were recorded.

Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

SLR-FM-24



Max. Marks: 56

08

05

Section – II

Q.6 Answer any four questions:

- Define Maximum dry density and optimum moisture content. a)
- Define over-consolidation ratio and how it is used to classify the soil. b)
- Draw compaction curve along with zero air void line (label all parts). c)
- Draw typical e p curve and label various parts of it. d)
- Write any four analogy between spring model and saturated soil e) (consolidation).
- Q.7 Explain step wise procedure for field compaction of soil. a)
 - The following are the results of a standard compaction test performed on a b) 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- Plot compaction curve and hence find OMC and MDD 1)
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- Q.8 a) Explain e- log p curve and derive the coefficient associated with it.
 - A clay specimen was tested in a laboratory consolidation device, which 05 b) was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m 1) thickness where only the top layer is drained
 - Time for 90% consolidation in the field with this soil with a 2.5 m 2) thickness where only the top layer is drained
- Q.9 Enlist the assumptions of Rankine's Theory of earth pressure. a)
 - Calculate total active earth pressure and its position with respect to bottom 05 b) of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having $\Upsilon = 18$ kN/m³, c = 0 and $\varphi = 27^{0}$ followed by second layer having $\Upsilon = 19$ kN/m³, c = 0 and $\varphi = 30^{\circ}$.

80

05

05

SLR-FM-24

Set Q

		GEOTECHNICAL	INGIN	IEERING - I
Day Time	& Date: 02:3	e: Monday, 09-12-2019 30 PM To 05:30 PM		Max. Marks: 70
Instr	uctio	ns: 1) Q. No. 1 is compulsory and sh	ould be	e solved in first 30 minutes in answer
		2) Figures to the right indicate full	marks	
		MCQ/Objective T	vne Qi	lestions
Dura	ition: 3	30 Minutes		Marks: 14
Q.1	Cho 1)	ose the correct alternatives from th Coefficient of volume compressibility curve	e opti / is the	ons and rewrite the sentence. 14 slope of which of following
		a) e - p curve c) flow curve	b) d)	e - log p curve None of these
	2)	If the soil is dry then percentage air a) 1 c) 0.50	void fo b) d)	r this soil is 0 None of these
	3)	Permeability of the soil is more when a) 0% c) 50%	n the d b) d)	egree of saturation of soil is 25% 100%
	4)	In compaction test graph is plotte density of soil. a) Bulk c) Dry	d betv b) d)	veen water content and Submerged Soil solid
	5)	Process of removal of water from th a) compaction c) compression	e soil i b) d)	s called consolidation none of these
	6)	Graphical method for finding earth p a) Terzaghi c) Boussinesq	oressur b) d)	e is given by Cassagrande Culman
	7)	Vane shear test is commonly used t a) Clayey c) Silty	o find : b) d)	shear strength of soil. Sandy Soft clayey soil
	8)	Height of fall of rammer in modified a) 250mm c) 400mm	compa b) d)	ction test is 310mm 450mm
	9)	Which of following shear strength te a) UU test c) CD test	st is qı b) d)	uick one? CU test None of these
	10)	Standard size of soil sample used for test is a) 30mm dia, and 60mm beight	br cond	lucting unconfined compression

Soat	
Jeal	

No.

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil** Engineering

Page **9** of **16**

SLR-FM-24

Set | R

- c)
- 50 cm dia and 100 cm length d) 10 cm dia and 20 cm length

11) If solid portion and void portion in a given mass of soil is same then porosity for this soil is _____.

- a) 1 b) 0.75 c) 0.50 d) 0.25
- 12) Which factors do not affect the permeability of soil ____
 - Shape of soil particle b) Size of soil particle

b)

- c) Specific gravity d) Porosity
- 13) Optimum moisture content of which soil is more at a given compaction effort _____.
 - a) Silt
 - c) Sand d) Sandy clay
- 14) Which roller is most suitable for compacting clayey soil?
 - a) Pneumatic

a)

b) Vibratory

Clay

c) Sheep foot

d) smooth wheel

_.

SLR-FM-24

Set | R

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it. a)
- Name two soil belonging to Fine grained soil and that belonging to coarse b) grained soil.
- Define air content and degree of saturation. C)
- Draw labelled sketch of triaxial shear apparatus (minimum four parts d) labeled).
- Draw graph used to calculate liquid limit for soil and show liquid limit on it. e)
- With suitable notation prove the relation $e = \frac{wG}{S_r}$ Q.3 a)
 - A soil sample has equal amounts of voids and solids, and also amount of 05 b) air and water in terms of volume is same; for this soil find
 - void ratio of the soil 1)
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - degree of saturation 5)
- Q.4 What is permeability of soil? Explain any four factors affecting permeability 05 a) of soil.
 - Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient b) 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - Parallel to the bedding plane 1)
 - Normal to the bedding plane 2)
- Q.5 What are different types of shear test based on drainage of soil? a)

Consolidated undrained test were carried out on a soil sample and 05 b) following observations were recorded.

Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

Max. Marks: 56

80

05

SLR-FM-24

Section – II

Q.6 Answer any four questions:

- a) Define Maximum dry density and optimum moisture content.
- b) Define over-consolidation ratio and how it is used to classify the soil.
- c) Draw compaction curve along with zero air void line (label all parts).
- d) Draw typical e p curve and label various parts of it.
- e) Write any four analogy between spring model and saturated soil (consolidation).
- **Q.7** a) Explain step wise procedure for field compaction of soil.
 - b) The following are the results of a standard compaction test performed on a 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- 1) Plot compaction curve and hence find OMC and MDD
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- **Q.8** a) Explain e- log p curve and derive the coefficient associated with it.
 - b) A clay specimen was tested in a laboratory consolidation device, which 05 was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained
 - 2) Time for 90% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained
- **Q.9** a) Enlist the assumptions of Rankine's Theory of earth pressure.
 - **b)** Calculate total active earth pressure and its position with respect to bottom **05** of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having Υ =18kN/m³, c = 0 and φ = 27⁰ followed by second layer having Υ =19kN/m³, c = 0 and φ = 30⁰.

08

05

SLR-FM-24

Set | R

05

			T.E. (Part - I) (CBCS) Exam Civil Engine	inatio eerin	on Nov/Dec-2019 g
			GEOTECHNICAL	IGIN	ĔERING - I
Day Time	& Date : 02:3	e: Mo 0 PM	nday, 09-12-2019 To 05:30 PM		Max. Marks: 70
Instr	uctio	ns: 1)	Q. No. 1 is compulsory and show book.	uld be	solved in first 30 minutes in answer
		2)	Figures to the right indicate full m	narks.	
Duro	tion: 2		MCQ/Objective Typ	e Qu	estions Marka: 14
	Choc	oo th	nues	ontic	Marks. 14
G. 1	1)	Grap a) c)	bhical method for finding earth pre Terzaghi Boussinesq	b) d)	is given by Cassagrande Culman
	2)	Vane a) c)	e shear test is commonly used to Clayey Silty	find s b) d)	hear strength of soil. Sandy Soft clayey soil
	3)	Heig a) c)	ht of fall of rammer in modified co 250mm 400mm	ompac b) d)	ction test is 310mm 450mm
	4)	Whic a) c)	ch of following shear strength test UU test CD test	is qui b) d)	ick one? CU test None of these
	5)	Stan	dard size of soil sample used for	condu	ucting unconfined compression
		test a) c)	is 30mm dia. and 60mm height 50 cm dia and 100 cm length	b) d)	38mm dia. and 76mm height 10 cm dia and 20 cm length
	6)	lf so poro	lid portion and void portion in a gi sity for this soil is	ven m	hass of soil is same then
		a) c)	0.50	d)	0.25
	7)	Whic a) c)	ch factors do not affect the perme Shape of soil particle Specific gravity	ability b) d)	of soil Size of soil particle Porosity
	8)	Optin effor	mum moisture content of which set to the set of the set	oil is n	nore at a given compaction
		a) c)	Silt Sand	b) d)	Clay Sandy clay
	9)	Whio a) c)	ch roller is most suitable for comp Pneumatic Sheep foot	acting b) d)	g clayey soil? Vibratory smooth wheel

Set S

Seat No.

10) Coefficient of volume compressibility is the slope of which of following curve _____. e - log p curve a) e - p curve b)

- d) None of these C) flow curve
- If the soil is dry then percentage air void for this soil is _____. 11)
 - a) b) 1 0 C)
 - 0.50 d) None of these
- Permeability of the soil is more when the degree of saturation of soil is ___. 12) a)
 - 0% b) 25%
 - 100% C) 50% d)
- 13) In compaction test graph is plotted between water content and _____ density of soil.
 - Bulk b) Submerged
 - Soil solid Dry d) c)
- Process of removal of water from the soil is called _____ 14)
 - compaction a)

a)

consolidation b)

SLR-FM-24

Set S

C) compression d) none of these

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 Civil Engineering

GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- a) Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- **b)** Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - b) A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- **Q.4 a)** What is permeability of soil? Explain any four factors affecting permeability **05** of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?

b) Consolidated undrained test were carried out on a soil sample and 05 following observations were recorded.

Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

SLR-FM-24



Max. Marks: 56

08

05

Set S

Section – II

Q.6 Answer any four questions:

- a) Define Maximum dry density and optimum moisture content.
- **b)** Define over-consolidation ratio and how it is used to classify the soil.
- c) Draw compaction curve along with zero air void line (label all parts).
- d) Draw typical e p curve and label various parts of it.
- e) Write any four analogy between spring model and saturated soil (consolidation).
- **Q.7** a) Explain step wise procedure for field compaction of soil.
 - b) The following are the results of a standard compaction test performed on a 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- 1) Plot compaction curve and hence find OMC and MDD
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- **Q.8** a) Explain e- log p curve and derive the coefficient associated with it.
 - b) A clay specimen was tested in a laboratory consolidation device, which was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - 1) Time for 50% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained
 - 2) Time for 90% consolidation in the field with this soil with a 2.5 m thickness where only the top layer is drained
- **Q.9** a) Enlist the assumptions of Rankine's Theory of earth pressure.
 - **b)** Calculate total active earth pressure and its position with respect to bottom **05** of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having Υ =18kN/m³, c = 0 and φ = 27⁰ followed by second layer having Υ =19kN/m³, c = 0 and φ = 30⁰.

08

05

05 05

Seat	
No.	

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL_ENGINEERING – I

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Acidity in water is caused due to _____
 - a) Mineral acids
 b) Iron sulphate
 c) Free CO₂
 d) All of the above
- 2) Turbidity of raw water is a measure of _____.
 - a) Suspended solids c) Acidity of water d) None of these
- Hardness of water is caused due to _____
 - a) Calcium sulphate b) Calcium Nitrates
 - c) Magnesium sulphate d) None of the above
- 4) Mostly used coagulant, is _____.
 a) Chlorine b) Lime
 - a) Chlorineb) Limec) Alumd) Bleaching Powder
- Aeration process is useful for the removal of ______
 a) Odour b) Susperation
 - b) Suspended solids
 - d) All of the above
- 6) Carbonates in water produce _____.
 a) temporary hardness
 b) permanent hardness
 c) acidity
 d) Alkanity
- 7) _____ is determined by titrating with standard EDTA solution & Eriochrome black T- indicator.
 a) Nitrates
 - a) Nitratesb) Hardnessc) Chloridesd) Turbidity
- 8) For a city developed haphazardly, the layout of distribution pipes preferred to, is _____.
 - a) Radial systemb) Ring systemc) Dead end systemd) Iron grid system
- 9) Water losses in water supply is assumed as _____
 - a) Test pressurec) Pipe pressure

c) Total solids

- b) Working pressure
- d) Design pressure



Max. Marks: 70

Marks: 14

is the pipe connecting to storage tank various fixtures and taps. 10)

- Distributing pipe a)
- b) Supply pipe
- Antisiphonage pipe C)
- d) Service pipe

SLR-FM-25

Set P

- 11) _ can follow direct routes and require shorter length of conduits.
 - a) Gravity conduit
- b) Aqueduct d) Pressure conduits
- Tunnels C)
- 12) To control the wastage of water ____ measures are taken. Pipe joints
 - b) Water taps
 - All of the above d)
- 13) Generally _____ supply will reduce.
 - Continuous a)

Zoning system

a)

C)

- Intermittent b) None of these
- c) Both a) and b) d)
- 14) Analysis of pipe networks of distribution system is calculated by _
 - a) Discharge in pipelines c)
- b) Equivalent pipe method
- Computation of pressure d) Mass curve method

09

No.		Set	
		T.E. (Part – I) (CBCS) Examination Nov/Dec-2019	
		ENVIRONMENTAL ENGINEERING – I	
Day 8	a Da	e: Wednesday, 11-12-2019 Max. Marks: 5	56
Time	02:3	0 PM To 05:30 PM	
Instru	uctio	 ns: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two from the remaining questions from each section. 3) Figure to the right indicates full marks 4) Assume suitable data wherever required and mention it clearly. 5) Use of non – programmable calculator is allowed. 	
		Section – I	
Q.2	a)	Write the values of drinking water standards. 1) pH 2) Akalinty 3) Hardness 4) Turbidity	D3
	b)	 5) Colour 6) Chlorides Population of 5 decades is given below: 	07
	-	Year19601970198019902000Population3500038000400004200049000Determine the population in year 2020 by geometrical increase methodand incremental increase method.	
Q.3	a)	Which equation to be used to find settling velocity? Derive the formula for the same.	04
	b)	 A settling tank is designed for an overflow rate of 6000 lit/m²/hr. What percentage of particles of diameter. 1) 0.06mm and 2) 0.03mm will be removed in this tank? Temperature of water is 27^oC and Sp. Gr. of particle are 2.65. 	05

- Q.4 a) Differentiate slow sand and rapid sand filter with respect to following 03 points.
 - b) Design a Flocullator for a flow of 7 MLD. Assume suitable data. 06

Q.5 Write a short note on (any three)

- a) Chemistry of chlorination
- **b)** Zeolite method
- c) Coagulation
- d) Aeration

Seat

SLR-FM-25



Set P

05

05

Section - II

- **Q.6 a)** Explain with neat sketch dead end system of distribution system.
 - **b)** Give drawbacks of intermittent system.
- Q.7 a) Explain the analytical method of fixing the capacity of service reservoir.
 O3 Calculate discharge through various pipes using Hardy cross method if the
 O6
 - **b)** Calculate discharge through various pipes using Hardy cross method if the K values in the expression for loss head $h_f = kQ^2$, & *AB*, *BC*, *AC*, *AD*, *DC* are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- **Q.8 a)** Enumerate various corrosion control methods.
 - **b)** Find the equivalent of 30cm equivalent diameter pipe of the network shown below by
 - 1) Darcy Weisbach equation
 - 2) Hazen William's formula

Note: L_1 , L_2 , L_3 are lengths & D_1 , D_2 , D_3 are diameters.



- **Q.9** Write short notes on any three of the following:
 - a) Check valve
 - b) Advantages of pressurized water supply system
 - c) Water meter
 - d) Fire demand

09

04

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019

Civil Engineering ENVIRONMENTAL ENGINEERING – I

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

4)

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

For a city developed haphazardly, the layout of distribution pipes preferred 1)

b)

- to, is _
- a) Radial system
- Dead end system C)
- 2) Water losses in water supply is assumed as b) Working pressure
 - Test pressure a)
 - c) Pipe pressure
- d) Design pressure

Ring system d) Iron grid system

- is the pipe connecting to storage tank various fixtures and taps. 3)
 - Distributing pipe a) Antisiphonage pipe c)
- b) Supply pipe d) Service pipe
- can follow direct routes and require shorter length of conduits.
- b) Aqueduct Gravity conduit a)
 - Tunnels d) Pressure conduits c)
- To control the wastage of water 5) measures are taken.
 - Pipe joints b) Water taps a)
 - Zoning system d) All of the above C)
- Generally _____ supply will reduce. 6)
 - Continuous b) Intermittent a)
 - Both a) and b) d) None of these C)
- 7) Analysis of pipe networks of distribution system is calculated by b) Equivalent pipe method
 - Discharge in pipelines a) c)
 - Computation of pressure d) Mass curve method
- Acidity in water is caused due to 8)
 - a) Mineral acids b) Iron sulphate All of the above c) Free CO₂ d)
- 9) Turbidity of raw water is a measure of
 - b) B.O.D. Suspended solids a)
 - c) Acidity of water d) None of these
- Hardness of water is caused due to _ 10)
 - a) Calcium sulphate c) Magnesium sulphate
- b) Calcium Nitrates
- d) None of the above

SLR-FM-25



Max. Marks: 70

Marks: 14

SLR-FM-25 Set Q

- Mostly used coagulant, is _____. 11)
 - a) Chlorine c) Alum
- b) Lime d) Bleaching Powder
- Aeration process is useful for the removal of _____. 12)
 - a) Odour Total solids
- b) Suspended solids
- d) All of the above
- Carbonates in water produce ____ 13) a) temporary hardness
- b) permanent hardness
- d) Alkanity
- _____ is determined by titrating with standard EDTA solution & 14) Eriochrome black T- indicator.
 - a) Nitrates

c) acidity

c)

c) Chlorides

- b) Hardness
- d) Turbidity

09

140.					
T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Civil Engineering					
		ENVIRONMENTAL ENGINEERING – I			
Day	& Da	te: Wednesday, 11-12-2019 Max. Marks	s: 56		
Time	02:3	30 PM To 05:30 PM			
Instr	 Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two from the remaining questions from each section. 3) Figure to the right indicates full marks 4) Assume suitable data wherever required and mention it clearly. 5) Use of non – programmable calculator is allowed 				
		Section – I			
Q.2	a)	Write the values of drinking water standards.	03		
	b)	 pH Akalinty Hardness Turbidity Colour Chlorides 	07		
	D)		07		
		Population 35000 38000 40000 42000 49000			
		Determine the population in year 2020 by geometrical increase method and incremental increase method.			
Q.3	a)	Which equation to be used to find settling velocity? Derive the formula for	04		
	b)	 A settling tank is designed for an overflow rate of 6000 lit/m²/hr. What percentage of particles of diameter. 1) 0.06mm and 2) 0.03mm will be removed in this tank? Temperature of water is 27⁰C and Sp. Gr. of particle are 2.65. 	05		

- **Q.4 a)** Differentiate slow sand and rapid sand filter with respect to following **03** points.
 - b) Design a Flocullator for a flow of 7 MLD. Assume suitable data. 06

Q.5 Write a short note on (any three)

- a) Chemistry of chlorination
- b) Zeolite method
- c) Coagulation
- d) Aeration

Seat

SLR-FM-25



Set Q

Section - II

- Q.6 a) Explain with neat sketch dead end system of distribution system. 05 05
 - Give drawbacks of intermittent system. b)
- Q.7 Explain the analytical method of fixing the capacity of service reservoir. 03 a) 06
 - Calculate discharge through various pipes using Hardy cross method if the b) K values in the expression for loss head $h_f = kQ^2$, & AB, BC, AC, AD, DC are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- Q.8 Enumerate various corrosion control methods. a)
 - Find the equivalent of 30cm equivalent diameter pipe of the network b) shown below by
 - Darcy Weisbach equation 1)
 - Hazen William's formula 2)

Note: L₁, L₂, L₃ are lengths & D₁, D₂, D₃ are diameters.



- Q.9 Write short notes on any three of the following:
 - Check valve a)
 - Advantages of pressurized water supply system b)
 - Water meter c)
 - Fire demand d)

09

04

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

ENVIRONMENTAL ENGINEERING – I

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

5)

a)

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Aeration process is useful for the removal of _____. 1)
 - b) Suspended solids a) Odour c) Total solids
 - d) All of the above
- 2) Carbonates in water produce ____
 - a) temporary hardness b) permanent hardness
 - c) acidity
- is determined by titrating with standard EDTA solution & 3) Eriochrome black T- indicator.
 - Nitrates b) Hardness a)
 - Chlorides d) Turbidity c)
- 4) For a city developed haphazardly, the layout of distribution pipes preferred to, is .
 - a) Radial system
- **Ring system** b) d) Iron grid system
- c) Dead end system Water losses in water supply is assumed as _
- a) Test pressure b) Working pressure
 - d) Design pressure c) Pipe pressure
- 6) is the pipe connecting to storage tank various fixtures and taps.
 - a) Distributing pipe c) Antisiphonage pipe
- b) Supply pipe d) Service pipe
- 7) _ can follow direct routes and require shorter length of conduits.
 - Gravity conduit b) Aqueduct d) Pressure conduits
 - Tunnels C)
- 8) To control the wastage of water measures are taken.
 - Pipe joints b) Water taps a)
 - d) All of the above Zoning system c)

9) Generally _____ supply will reduce.

- Continuous a)
- c) Both a) and b)
- b) Intermittent
- d) None of these

SLR-FM-25



Max. Marks: 70

Marks: 14

- d) Alkanity

			SLI	R-FM-	25
				Set	R
Ana a) c)	lysis of pipe networks of distril Discharge in pipelines Computation of pressure	bution b) d)	system is calculated by Equivalent pipe method Mass curve method		

Computation of pressure C) Acidity in water is caused due to _____ 11)

- a) Mineral acids b) Iron sulphate
- c) Free CO₂ d) All of the above
- 12) Turbidity of raw water is a measure of _____
 - b) B. O. D. Suspended solids a)
 - c) Acidity of water d) None of these
- Hardness of water is caused due to ____ 13)
 - a) Calcium sulphate
- b) Calcium Nitrates d) None of the above
 - c) Magnesium sulphate
- 14) Mostly used coagulant, is _____. a) Chlorine
 - c) Alum

10)

b) Lime

.

d) Bleaching Powder

		T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Civil Engineering			
ENVIRONMENTAL ENGINEERING – I					
Day Time	& Da 9 02:3	te: Wednesday, 11-12-2019 Max. Marks 30 PM To 05:30 PM	: 56		
Instr	uctio	 bns: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two from the remaining questions from each section. 3) Figure to the right indicates full marks 4) Assume suitable data wherever required and mention it clearly. 5) Use of non – programmable calculator is allowed. 			
		Section – I			
Q.2	a)	 Write the values of drinking water standards. 1) pH 2) Akalinty 3) Hardness 4) Turbidity 5) Colour 6) Chlorides 	03		
	b)	Population of 5 decades is given below:	07		
		Year19601970198019902000Population3500038000400004200049000			
	Determine the population in year 2020 by geometrical increase method and incremental increase method.				
Q.3	a)	Which equation to be used to find settling velocity? Derive the formula for the same	04		
	b)	 A settling tank is designed for an overflow rate of 6000 lit/m²/hr. What percentage of particles of diameter. 1) 0.06mm and 2) 0.03mm will be removed in this tank? Temperature of water is 27⁰C and Sp. Gr. of particle are 2.65. 	05		
Q.4	a)	Differentiate slow sand and rapid sand filter with respect to following points.	03		
~ -	b)	Design a Flocultator for a flow of 7 MLD. Assume suitable data.	06		
Q.5	Wri	te a short note on (any three)	09		

- a) Chemistry of chlorinationb) Zeolite method
- Coagulation Aeration c)
- d)

Seat No.

SLR-FM-25



Set R

05

05

Section - II

- **Q.6** a) Explain with neat sketch dead end system of distribution system.
 - **b)** Give drawbacks of intermittent system.
- Q.7 a) Explain the analytical method of fixing the capacity of service reservoir.
 O3 Calculate discharge through various pipes using Hardy cross method if the
 O6
 - **b)** Calculate discharge through various pipes using Hardy cross method if the K values in the expression for loss head $h_f = kQ^2$, & *AB*, *BC*, *AC*, *AD*, *DC* are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- **Q.8 a)** Enumerate various corrosion control methods.
 - b) Find the equivalent of 30cm equivalent diameter pipe of the network shown below by
 - 1) Darcy Weisbach equation
 - 2) Hazen William's formula

Note: L_1 , L_2 , L_3 are lengths & D_1 , D_2 , D_3 are diameters.



- **Q.9** Write short notes on any three of the following:
 - a) Check valve
 - b) Advantages of pressurized water supply system
 - c) Water meter
 - d) Fire demand

09

04

Seat	
No.	

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – I**

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

1)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

_____ is the pipe connecting to storage tank various fixtures and taps.

- Distributing pipe a)
- b) Supply pipe
- Antisiphonage pipe d) Service pipe
- 2) can follow direct routes and require shorter length of conduits. b) Aqueduct
 - a) Gravity conduit Tunnels C)
- d) Pressure conduits
- 3) To control the wastage of water _____ measures are taken.
 - a) Pipe joints b) Water taps
 - c) Zoning system d) All of the above
- Generally _____ supply will reduce. 4)
 - a) Continuous b) Intermittent Both a) and b) d) None of these c)
- 5) Analysis of pipe networks of distribution system is calculated by _
 - a) Discharge in pipelines b) Equivalent pipe method d) Mass curve method
 - c) Computation of pressure
- Acidity in water is caused due to 6) a) Mineral acids Iron sulphate b)
 - c) Free CO₂ d) All of the above
- Turbidity of raw water is a measure of _ 7) a) Suspended solids b) B.O.D.
 - c) Acidity of water d) None of these
- Hardness of water is caused due to 8)
 - a) Calcium sulphate b) Calcium Nitrates
 - Magnesium sulphate d) None of the above c)
- 9) Mostly used coagulant, is a) Chlorine b) Lime
 - d) Bleaching Powder C) Alum
- Aeration process is useful for the removal of _____ 10) Odour b) Suspended solids a)
 - c) Total solids d) All of the above

Max. Marks: 70

Marks: 14

- Carbonates in water produce _____ 11)
 - a) temporary hardness
- b) permanent hardness

Set S

- c) acidity d) Alkanity
- _____ is determined by titrating with standard EDTA solution & 12) Eriochrome black T- indicator. Nitrates
 - b) Hardness
 - Chlorides d) Turbidity C)
- For a city developed haphazardly, the layout of distribution pipes preferred 13) to, is ___ ____-•
 - a) Radial system

a)

- b) Ring system
- d) Iron grid system c) Dead end system
- 14) Water losses in water supply is assumed as _
 - a) Test pressure

b) Working pressure

___.

c) Pipe pressure

d) Design pressure

09

		T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL ENGINEERING – I	
Day Time	& Da 9 02:3	tte: Wednesday, 11-12-2019 Max. Marks: 5 30 PM To 05:30 PM	56
Instr	uctio	 ons: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two from the remaining questions from each section. 3) Figure to the right indicates full marks 4) Assume suitable data wherever required and mention it clearly. 5) Use of non – programmable calculator is allowed. 	
		Section – I	
Q.2	a)	Write the values of drinking water standards.)3
		1) pH	
		2) Akalinty 2) Herdness	
		3) Hardness 4) Turbidity	
		5) Colour	
		6) Chlorides	
	b)	Population of 5 decades is given below:)7
	,	Year 1960 1970 1980 1990 2000	
		Population 35000 38000 40000 42000 49000	
		Determine the population in year 2020 by geometrical increase method	
		and incremental increase method.	
03	ə)	Which equation to be used to find settling velocity? Derive the formula for	14
Q.J	aj	the same	/-
	b)	A settling tank is designed for an overflow rate of 6000 lit/m ² /hr. What)5
		percentage of particles of diameter.	
		1) 0.06mm and	
		2) 0.03mm will be removed in this tank?	
		Temperature of water is 27° C and Sp. Gr. of particle are 2.65.	
Q.4	a)	Differentiate slow sand and rapid sand filter with respect to following)3
	-	points.	
	b)	Design a Flocullator for a flow of 7 MLD. Assume suitable data.)6

- Q.5 Write a short note on (any three)a) Chemistry of chlorination

 - Zeolite method b)
 - Coagulation C)
 - Aeration d)

Seat

No.

SLR-FM-25



Set S

05

05

Section - II

- **Q.6 a)** Explain with neat sketch dead end system of distribution system.
 - **b)** Give drawbacks of intermittent system.
- Q.7 a) Explain the analytical method of fixing the capacity of service reservoir.
 O3 Calculate discharge through various pipes using Hardy cross method if the
 O6
 - **b)** Calculate discharge through various pipes using Hardy cross method if the K values in the expression for loss head $h_f = kQ^2$, & *AB*, *BC*, *AC*, *AD*, *DC* are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- **Q.8 a)** Enumerate various corrosion control methods.
 - **b)** Find the equivalent of 30cm equivalent diameter pipe of the network shown below by
 - 1) Darcy Weisbach equation
 - 2) Hazen William's formula

Note: L_1 , L_2 , L_3 are lengths & D_1 , D_2 , D_3 are diameters.



- **Q.9** Write short notes on any three of the following:
 - a) Check valve
 - b) Advantages of pressurized water supply system
 - c) Water meter
 - d) Fire demand

09

04

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING - II

Day & Date: Friday, 13-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

1)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The maximum quantity of water that is estimated to remain available in a storage reservoir for supply, even during worst dry periods, is known as it
 - Firm yield a)
 - Design yield b) Reservoir yield d) Primary yield
- 2) The 'surcharge storage' in a dam reservoir is the volume of water stored between
 - minimum and maximum reservoir levels a)
 - b) minimum and normal reservoir levels
 - C) normal and maximum reservoir levels
 - d) none of the above
- 3) Transverse joint in concrete gravity dams are the
 - horizontal construction joints at each lift height a)
 - vertical construction joints full of height and width b)
 - c) diagonal construction joints for torsion
 - none of the above d)
- In order to economise on the provided section of a concrete gravity dam, 4) attempts are made to reduce the uplift, by
 - providing drainage gallery to collect seepage water a)
 - b) constructing cutoff under upstream face
 - pressure grouting in dam foundation c)
 - all the above methods d)

When seepage takes place through the body of an earthen dam, it leads 5)

- to
- a) Development of pore pressures in the dam body
- Reduction in the shear strength of the dam b)
- Reduction in the developed shear stresses in the dam c)
- Both a & b d)
- When the water level standing against an earthen embankment, suddenly 6) falls down, then there is an imminent risk of sliding failure, to the _____.
 - upstream slope a) c) both a & b
- downstream slope b)
 - d) none of these

Max. Marks: 70

Marks: 14

Set





- 7) When the crest of an ogee spillway is designed to be in accordance with the lower nappe of a free falling water jet over a duly ventilated sharp crested weir, then theoretically _____.
 - a) the pressure on the spillway crest always be zero (i.e. atmospheric pressure)
 - b) the pressure on the spillway crest will be zero at design head only
 - c) the pressure on the spillway crest will always be negative
 - d) the pressure on the spillway crest will always be positive
- 8) Bligh's theory, as applied to the design of weirs and barrages on permeable foundations, account for _____.
 - a) hydrostatic forces only
- b) hydrodynamic forces only
- c) both a and b
- d) none of them
- The safety of a hydraulic structure founded on previous foundation can be ensured _____.
 - a) by providing sufficient length of its concrete floor
 - b) by providing sufficient depth of its concrete floor
 - c) by providing a downstream cutoff of some reasonable depth
 - d) all of the above

C)

- 10) An alluvial river increases its length by meandering due to _____.
 - a) variation of discharge
- b) variation of land topography
- both a and b d) none of the above
- 11) The upstream angle of inclination of a repelling groyne with normal to the bank line, is of the order of _____.

a)	5 to 10°	b)	10 to 30°
C)	30 to 50°	d)	70 to 90°

- 12) Identify the correct statement in regard to hydropower ____
 - a) hydropower stations are generally labour oriented
 - b) Gestation period for hydro-power plant is usually small
 - c) the hydro generators give high efficiency over a wide range of load
 - d) in a hydropower scheme, the firm power is usually high, as compared to total power
- 13) A run off river plant for hydro power generation is essentially a _____.
 - a) high head scheme b) low head scheme
 - c) medium head scheme d) any of these
- 14) You have to select turbines for a hydropower plant, working on 150m head. The water is sandy and load on the plant is highly variable. Which type of turbines will you generally recommend?
 - a) Pelton's turbines

- b) Francis turbines
- c) Kaplan turbines
- d) Any of them will do

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q.No.3 and Q.No.9 are compulsory.

2) Attempt any two questions from each section

Top width

Section – I

- Q.2 a) Explain the mass curve method that can be used for determining 05 reservoir capacity for fulfilling the given demand.
 b) Discuss with a neat sketch, the various storage zones and control levels of 04 the dam reservoir.
- Q.3 a) Figure shows a cross section of non-overflow section of a gravity dam built of concrete. Calculate the maximum vertical stress at the heel and toe of the dam. Assume weight of concrete as 23.5 kN/m³. Upstream water level is at Maximum Water level (285m) tail water depth is 6m as shown in Figure 1. Neglect earthquake effects.

- Q.4 a) Distinguish between 'Constant radius' and 'Constant angle' layouts of 05 an 'Arch dam'. What is the best value of angle for constant angle arch dam?
 - b) Draw a cross section of a 'Zoned Embankment type Earth Dam' and discuss the significance of each component.
 04



6 m RL 289 m MWL 285 m C/L Drainage gallery RL 205 m Figure - 1

SLR-FM-26

Max. Marks: 56



		SLR-FM	-26
		Set	Ρ
Q.5	a) b)	A saddle siphon spillway has the following data. Full reservoir level = 485 m, Level of centre of siphon outlet = 479.6 m, Highest flood level = 485.9 m, Highest flood discharge = 570 cumec. If the dimensions of the throat of the siphon are: width = 4.2 m and height = 1.9 m, determine the number of siphon units required to pass the flood safely. The siphon is to discharge freely in air. Assume coefficient of discharge = 0.65. What are different kinds of spillways and how are they selected for individual conditions?	05 04
		Section – II	
Q.6	a)	Discuss briefly, the causes of failure of hydraulic structures, founded on	05
	b)	What are Kolhapur type weirs? Describe the operation policy of KT weirs over the water year.	04
Q.7	a) b)	Give an account of the investigations and surveys required while planning an irrigation canal project in a given tract of land. Discuss the factors governing the selection of alignment of the main canal and its branches. What the different types are of cross drainage works that are necessary	05 04
	,	on a canal alignment? State briefly the conditions under which each one is used.	•
Q.8	a)	 Explain how do the following assist in river control: 1) Spurs 2) Revetment 3) Guide bunds 	05
	b)	What is meant by water-logging? What are its ill effects? Describe some anti-water-logging measures with suitable sketches.	04
Q.9	a)	Distinguish clearly between run-off river Hydropower plants and storage type hydropower plants.	05
	b)	A runoff river plant has a installed capacity of 15000 kW and operates at 15 % load factor when it serves as a peak load station. What should be the minimum discharge in the stream so that it may serve as a base load station? The plant efficiency may be taken as 75% when working under a	05

station? The plant efficiency may be taken as 75% when working under a head of 20m. Also calculate the maximum load factor of the plant when the discharge in the stream is 20 m^3/s .

Seat No.

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING - II

Day & Date: Friday, 13-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Bligh's theory, as applied to the design of weirs and barrages on 1) permeable foundations, account for _
 - hydrostatic forces only a)
 - both a and b c)
- hydrodynamic forces only b) none of them d)
- 2) The safety of a hydraulic structure founded on previous foundation can be ensured ___.
 - a) by providing sufficient length of its concrete floor
 - by providing sufficient depth of its concrete floor b)
 - by providing a downstream cutoff of some reasonable depth c)
 - d) all of the above
- An alluvial river increases its length by meandering due to _____ 3)
 - variation of discharge a) both a and b c)
- variation of land topography b) none of the above d)
- 4) The upstream angle of inclination of a repelling groyne with normal to the bank line, is of the order of .
 - 5 to 10° 10 to 30° a) b)
 - c) 30 to 50° d) 70 to 90°
- Identify the correct statement in regard to hydropower _ 5)
 - a) hydropower stations are generally labour oriented
 - b) Gestation period for hydro-power plant is usually small
 - the hydro generators give high efficiency over a wide range of load c)
 - d) in a hydropower scheme, the firm power is usually high, as compared to total power
- A run off river plant for hydro power generation is essentially a _____. 6)
 - high head scheme low head scheme a) b) anv of these
 - medium head scheme d) c)
- You have to select turbines for a hydropower plant, working on 150m 7) head. The water is sandy and load on the plant is highly variable. Which type of turbines will you generally recommend?
 - Pelton's turbines Francis turbines a) b)
 - Kaplan turbines d) Any of them will do C)

Set

Max. Marks: 70

Marks: 14



- The maximum quantity of water that is estimated to remain available in a 8) storage reservoir for supply, even during worst dry periods, is known as it
 - a) Firm yield

- b) Design yield
- Reservoir yield d) Primary yield C)
- 9) The 'surcharge storage' in a dam reservoir is the volume of water stored between
 - minimum and maximum reservoir levels a)
 - b) minimum and normal reservoir levels
 - normal and maximum reservoir levels C)
 - d) none of the above
- 10) Transverse joint in concrete gravity dams are the
 - horizontal construction joints at each lift height a)
 - vertical construction joints full of height and width b)
 - diagonal construction joints for torsion C)
 - none of the above d)
- 11) In order to economise on the provided section of a concrete gravity dam, attempts are made to reduce the uplift, by _
 - providing drainage gallery to collect seepage water a)
 - constructing cutoff under upstream face b)
 - c) pressure grouting in dam foundation
 - all the above methods d)
- 12) When seepage takes place through the body of an earthen dam, it leads to
 - Development of pore pressures in the dam body a)
 - b) Reduction in the shear strength of the dam
 - Reduction in the developed shear stresses in the dam c)
 - Both a & b d)
- When the water level standing against an earthen embankment, suddenly 13) falls down, then there is an imminent risk of sliding failure, to the _____.
 - a) upstream slope b) downstream slope C) both a & b
 - none of these d)
- When the crest of an ogee spillway is designed to be in accordance with 14) the lower nappe of a free falling water jet over a duly ventilated sharp crested weir, then theoretically
 - the pressure on the spillway crest always be zero (i.e. atmospheric a) pressure)
 - b) the pressure on the spillway crest will be zero at design head only
 - the pressure on the spillway crest will always be negative C)
 - the pressure on the spillway crest will always be positive d)

Seat No.

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING - II

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.3 and Q.No.9 are compulsory.

2) Attempt any two guestions from each section

Section – I

- Q.2 Explain the mass curve method that can be used for determining 05 a) reservoir capacity for fulfilling the given demand. Discuss with a neat sketch, the various storage zones and control levels of b) 04 the dam reservoir.
- Figure shows a cross section of non-overflow section of a gravity dam Q.3 a) 10 built of concrete. Calculate the maximum vertical stress at the heel and toe of the dam. Assume weight of concrete as 23.5 kN/m³. Upstream water level is at Maximum Water level (285m) tail water depth is 6m as shown in Figure 1. Neglect earthquake effects.

- Distinguish between 'Constant radius' and 'Constant angle' layouts of Q.4 05 a) an 'Arch dam'. What is the best value of angle for constant angle arch dam?
 - Draw a cross section of a 'Zoned Embankment type Earth Dam' and b) 04 discuss the significance of each component.



Set



Max. Marks: 56

SLR-FM-26
		SLR-FM	-26
		Set	Q
Q.5	a) b)	A saddle siphon spillway has the following data. Full reservoir level = 485 m, Level of centre of siphon outlet = 479.6 m, Highest flood level = 485.9 m, Highest flood discharge = 570 cumec. If the dimensions of the throat of the siphon are: width = 4.2 m and height = 1.9 m, determine the number of siphon units required to pass the flood safely. The siphon is to discharge freely in air. Assume coefficient of discharge = 0.65. What are different kinds of spillways and how are they selected for individual conditions?	05 04
		Section – II	
Q.6	a)	Discuss briefly, the causes of failure of hydraulic structures, founded on	05
	b)	What are Kolhapur type weirs? Describe the operation policy of KT weirs over the water year.	04
Q.7	a)	Give an account of the investigations and surveys required while planning an irrigation canal project in a given tract of land. Discuss the factors governing the selection of alignment of the main canal and its branches.	05
	D)	on a canal alignment? State briefly the conditions under which each one is used.	04
Q.8	a)	 Explain how do the following assist in river control: 1) Spurs 2) Revetment 3) Guide bunds 	05
	b)	What is meant by water-logging? What are its ill effects? Describe some anti-water-logging measures with suitable sketches.	04
Q.9	a)	Distinguish clearly between run-off river Hydropower plants and storage type hydropower plants.	05
	b)	A runoff river plant has a installed capacity of 15000 kW and operates at 15 % load factor when it serves as a peak load station. What should be the minimum discharge in the stream so that it may serve as a base load station? The plant efficiency may be taken as 75% when working under a	05

station? The plant efficiency may be taken as 75% when working under a head of 20m. Also calculate the maximum load factor of the plant when the discharge in the stream is 20 m³/s.

SLR-FM-26	6
-----------	---

Max. Marks: 70

_	 	т	C	1
No.				
Seat				

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING - II

Day & Date: Friday, 13-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- When seepage takes place through the body of an earthen dam, it leads 1) to
 - Development of pore pressures in the dam body a)
 - Reduction in the shear strength of the dam b)
 - Reduction in the developed shear stresses in the dam c)
 - d) Both a & b
 - 2) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the _____. downstream slope
 - upstream slope a) b) C) both a & b
 - d) none of these
 - When the crest of an ogee spillway is designed to be in accordance with 3) the lower nappe of a free falling water jet over a duly ventilated sharp crested weir, then theoretically
 - the pressure on the spillway crest always be zero (i.e. atmospheric a) pressure)
 - the pressure on the spillway crest will be zero at design head only b)
 - the pressure on the spillway crest will always be negative c)
 - the pressure on the spillway crest will always be positive d)
 - Bligh's theory, as applied to the design of weirs and barrages on 4) permeable foundations, account for
 - hydrostatic forces only hydrodynamic forces only b)
 - both a and b none of them c) d)
 - The safety of a hydraulic structure founded on previous foundation can be 5) ensured
 - by providing sufficient length of its concrete floor a)
 - by providing sufficient depth of its concrete floor b)
 - by providing a downstream cutoff of some reasonable depth c)
 - all of the above d)

a)

a)

- 6) An alluvial river increases its length by meandering due to _ variation of discharge
 - b) variation of land topography
 - both a and b d) none of the above C)
- 7) The upstream angle of inclination of a repelling groyne with normal to the bank line, is of the order of ____
 - 5 to 10° 10 to 30° a) b)
 - 30 to 50° C) d) 70 to 90°



Marks: 14

8) Identify the correct statement in regard to hydropower ____

- a) hydropower stations are generally labour oriented
- b) Gestation period for hydro-power plant is usually small
- c) the hydro generators give high efficiency over a wide range of load
- d) in a hydropower scheme, the firm power is usually high, as compared to total power
- 9) A run off river plant for hydro power generation is essentially a _____.
 - a) high head scheme
- b) low head scheme

SLR-FM-26

Set

- c) medium head scheme d) any of these
- 10) You have to select turbines for a hydropower plant, working on 150m head. The water is sandy and load on the plant is highly variable. Which type of turbines will you generally recommend?
 - a) Pelton's turbines
- b) Francis turbines
- c) Kaplan turbines d)
 - d) Any of them will do
- 11) The maximum quantity of water that is estimated to remain available in a storage reservoir for supply, even during worst dry periods, is known as it .
 - a) Firm yield

- b) Design yield
- c) Reservoir yield d) Primary yield
- 12) The 'surcharge storage' in a dam reservoir is the volume of water stored between _____.
 - a) minimum and maximum reservoir levels
 - b) minimum and normal reservoir levels
 - c) normal and maximum reservoir levels
 - d) none of the above
- 13) Transverse joint in concrete gravity dams are the ____
 - a) horizontal construction joints at each lift height
 - b) vertical construction joints full of height and width
 - c) diagonal construction joints for torsion
 - d) none of the above
- 14) In order to economise on the provided section of a concrete gravity dam, attempts are made to reduce the uplift, by _____.
 - a) providing drainage gallery to collect seepage water
 - b) constructing cutoff under upstream face
 - c) pressure grouting in dam foundation
 - d) all the above methods

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING - II

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q.No.3 and Q.No.9 are compulsory.

2) Attempt any two questions from each section

- Q.2 Explain the mass curve method that can be used for determining 05 a) reservoir capacity for fulfilling the given demand. Discuss with a neat sketch, the various storage zones and control levels of b) 04
- Figure shows a cross section of non-overflow section of a gravity dam Q.3 a) 10 built of concrete. Calculate the maximum vertical stress at the heel and toe of the dam. Assume weight of concrete as 23.5 kN/m³. Upstream water level is at Maximum Water level (285m) tail water depth is 6m as shown in Figure 1. Neglect earthquake effects.

- Distinguish between 'Constant radius' and 'Constant angle' layouts of Q.4 05 a) an 'Arch dam'. What is the best value of angle for constant angle arch dam?
 - Draw a cross section of a 'Zoned Embankment type Earth Dam' and b) 04 discuss the significance of each component.





SLR-FM-26

Max. Marks: 56



		SLR-FM	-26
		Set	R
Q.5	a) b)	A saddle siphon spillway has the following data. Full reservoir level = 485 m, Level of centre of siphon outlet = 479.6 m, Highest flood level = 485.9 m, Highest flood discharge = 570 cumec. If the dimensions of the throat of the siphon are: width = 4.2 m and height = 1.9 m, determine the number of siphon units required to pass the flood safely. The siphon is to discharge freely in air. Assume coefficient of discharge = 0.65. What are different kinds of spillways and how are they selected for individual conditions?	05 04
		Section – II	
Q.6	a)	Discuss briefly, the causes of failure of hydraulic structures, founded on	05
	b)	pervious foundations. What are Kolhapur type weirs? Describe the operation policy of KT weirs over the water year.	04
Q.7	a)	Give an account of the investigations and surveys required while planning an irrigation canal project in a given tract of land. Discuss the factors governing the selection of alignment of the main canal and its branches.	05
	b)	What the different types are of cross drainage works that are necessary on a canal alignment? State briefly the conditions under which each one is used.	04
Q.8	a)	 Explain how do the following assist in river control: 1) Spurs 2) Revetment 3) Guide bunds 	05
	b)	What is meant by water-logging? What are its ill effects? Describe some anti-water-logging measures with suitable sketches.	04
Q.9	a)	Distinguish clearly between run-off river Hydropower plants and storage type hydropower plants.	05
	b)	A runoff river plant has a installed capacity of 15000 kW and operates at 15 % load factor when it serves as a peak load station. What should be the minimum discharge in the stream so that it may serve as a base load station? The plant efficiency may be taken as 75% when working under a	05

station? The plant efficiency may be taken as 75% when working under head of 20m. Also calculate the maximum load factor of the plant when the discharge in the stream is 20 m^3/s .

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019

none of the above

Francis turbines

Civil Engineering

WATER RESOURCES ENGINEERING - II

Day & Date: Friday, 13-12-2019

Seat

No.

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Q.1

- Choose the correct alternatives from the options and rewrite the sentence. An alluvial river increases its length by meandering due to 1)
 - variation of discharge b) variation of land topography a)
 - both a and b C) d)
- 2) The upstream angle of inclination of a repelling groyne with normal to the bank line, is of the order of .
 - 5 to 10° b) 10 to 30° a)
 - c) 30 to 50° d) 70 to 90°

3) Identify the correct statement in regard to hydropower

- hydropower stations are generally labour oriented a)
- Gestation period for hydro-power plant is usually small b)
- the hydro generators give high efficiency over a wide range of load c)
- d) in a hydropower scheme, the firm power is usually high, as compared to total power
- 4) A run off river plant for hydro power generation is essentially a _____. b) low head scheme
 - high head scheme a) C)
 - medium head scheme d) any of these
- You have to select turbines for a hydropower plant, working on 150m 5) head. The water is sandy and load on the plant is highly variable. Which type of turbines will you generally recommend?
 - Pelton's turbines a) b)
 - Kaplan turbines d) Any of them will do c)
- 6) The maximum quantity of water that is estimated to remain available in a storage reservoir for supply, even during worst dry periods, is known as it
 - Firm vield a)
 - Design vield b) Reservoir yield d) Primary yield c)
- 7) The 'surcharge storage' in a dam reservoir is the volume of water stored between
 - minimum and maximum reservoir levels a)
 - minimum and normal reservoir levels b)
 - normal and maximum reservoir levels C)
 - none of the above d)

Set

Max. Marks: 70

Marks: 14

14

- 8) Transverse joint in concrete gravity dams are the _____
 - a) horizontal construction joints at each lift height
 - b) vertical construction joints full of height and width
 - c) diagonal construction joints for torsion
 - d) none of the above
- 9) In order to economise on the provided section of a concrete gravity dam, attempts are made to reduce the uplift, by _____.
 - a) providing drainage gallery to collect seepage water
 - b) constructing cutoff under upstream face
 - c) pressure grouting in dam foundation
 - d) all the above methods
- 10) When seepage takes place through the body of an earthen dam, it leads to _____.
 - a) Development of pore pressures in the dam body
 - b) Reduction in the shear strength of the dam
 - c) Reduction in the developed shear stresses in the dam
 - d) Both a & b
- 11) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the _____.
 - a) upstream slope b) downstream slope
 - c) both a & b d) none of these
- 12) When the crest of an ogee spillway is designed to be in accordance with the lower nappe of a free falling water jet over a duly ventilated sharp crested weir, then theoretically _____.
 - a) the pressure on the spillway crest always be zero (i.e. atmospheric pressure)
 - b) the pressure on the spillway crest will be zero at design head only
 - c) the pressure on the spillway crest will always be negative
 - d) the pressure on the spillway crest will always be positive
- 13) Bligh's theory, as applied to the design of weirs and barrages on permeable foundations, account for _____.
 - a) hydrostatic forces only
- es only b) hydrodynamic forces only d) none of them
 - c) both a and b d) none of them
- 14) The safety of a hydraulic structure founded on previous foundation can be ensured _____.
 - a) by providing sufficient length of its concrete floor
 - b) by providing sufficient depth of its concrete floor
 - c) by providing a downstream cutoff of some reasonable depth
 - d) all of the above

Set

T.E. (Part - I) (CBCS) Examination Nov/Dec-2019

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

C/L

No.

Instructions: 1) Q.No.3 and Q.No.9 are compulsory.

2) Attempt any two questions from each section

Top width

Section – I

- Q.2 Explain the mass curve method that can be used for determining a) reservoir capacity for fulfilling the given demand. Discuss with a neat sketch, the various storage zones and control levels of b) 04 the dam reservoir.
- Figure shows a cross section of non-overflow section of a gravity dam Q.3 a) 10 built of concrete. Calculate the maximum vertical stress at the heel and toe of the dam. Assume weight of concrete as 23.5 kN/m³. Upstream water level is at Maximum Water level (285m) tail water depth is 6m as shown in Figure 1. Neglect earthquake effects.

Distinguish between 'Constant radius' and 'Constant angle' layouts of Q.4 05 a) an 'Arch dam'. What is the best value of angle for constant angle arch dam?

Figure – 1

Draw a cross section of a 'Zoned Embankment type Earth Dam' and b) 04 discuss the significance of each component.

56 m





SLR-FM-26

Set

6 т RL 289 m MWL 285 m RL 280 m Drainage gallery 8 m **TWL 211m** RL 205 m

		SLR-FM-	-26
		Set	S
Q.5	a) b)	A saddle siphon spillway has the following data. Full reservoir level = 485 m, Level of centre of siphon outlet = 479.6 m, Highest flood level = 485.9 m, Highest flood discharge = 570 cumec. If the dimensions of the throat of the siphon are: width = 4.2 m and height = 1.9 m, determine the number of siphon units required to pass the flood safely. The siphon is to discharge freely in air. Assume coefficient of discharge = 0.65. What are different kinds of spillways and how are they selected for individual conditions?	05 04
		Section – II	
Q.6	a)	Discuss briefly, the causes of failure of hydraulic structures, founded on	05
	b)	What are Kolhapur type weirs? Describe the operation policy of KT weirs over the water year.	04
Q.7	a)	Give an account of the investigations and surveys required while planning an irrigation canal project in a given tract of land. Discuss the factors governing the selection of alignment of the main canal and its branches.	05
	b)	What the different types are of cross drainage works that are necessary on a canal alignment? State briefly the conditions under which each one is used.	04
Q.8	a)	 Explain how do the following assist in river control: 1) Spurs 2) Revetment 3) Guide bunds 	05
	b)	What is meant by water-logging? What are its ill effects? Describe some anti-water-logging measures with suitable sketches.	04
Q.9	a)	Distinguish clearly between run-off river Hydropower plants and storage type hydropower plants.	05
	b)	A runoff river plant has a installed capacity of 15000 kW and operates at 15 % load factor when it serves as a peak load station. What should be the minimum discharge in the stream so that it may serve as a base load station? The plant efficiency may be taken as 75% when working under a	05

station? The plant efficiency may be taken as 75% when working under a head of 20m. Also calculate the maximum load factor of the plant when the discharge in the stream is 20 m³/s.

T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

TRANSPORTATION ENGINEERING – I

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) In a district where the rainfall is heavy, a state highway of high type bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m 0.05 m b)
 - c) 0.07 m 0.06 m d)

2) The stopping sight distance depends upon _____ b) speed of vehicle

- a) total reaction time
- c) efficiency of brakes d) all of the above
- When the path travelled along the road surface is more than the circumferential 3) movement of the wheels due to rotation, then it results in . Skidding
 - a) Slipping Turning c)
 - b) d) Revolving
- 4) Match List-I with List-II and select the correct answer using the codes given below the lists.

List -1			List -1		
Α	Penetration Test	1	Overlay Design		
В	Marshal Test	2	Determination of Softening Point		
С	Ring and Ball Test	3	Gradation of asphalt cement		
D Benkelman Beam Test		4	Design of bituminous concrete mix		
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4		
c) A-3, B-2, C-4, D-1			d) A A-3, B-4, C-2, D-1		

- On a single lane road with two-way traffic, the minimum stopping sight 5) distance is equal to _ .
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance

Max. Marks: 70

Marks: 14

14

SLR-FM-27

Set

Seat No.





Set P

- 6) The maximum allowable Los Angeles abrasion value for high quality surface course is _____.
 - a) 10% b) 20%
 - c) 30% d) 45%
- 7) Maximum number of vehicles can be parked with _____
 - a) parallel parking b) 30° angle parking
 - c) 45° angle parking d) 90° angle parking
- 8) Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 9) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods
- 10) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is _____.
 - a) 15.07cm b) 14.07cm
 - c) 16.07cm d) 17.07cm
- 11) Critical combination of stresses at edge in rigid pavement during summer mid-day are, _____.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 12) The main objective of prime coat is, ____
 - a) Penetrate deep in to the pavement surface and plug the voids
 - b) Coat and bond the loose particles on the surface
 - c) Render the surface of the base course water resistant
 - d) All the above
- 13) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these
- 14) In order to justify the proposed improvement, the benefit-cost ratio should be _____.
 - a) Less than 1.0

- b) Greater than 1.0
- c) Between 0 to 1
- d) Less than 0.5

Seat	
No.	

T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic.
 - Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? 07
- Write a detailed note on "Origin and Destination studies". c)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? C)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - Initial Traffic in each direction on counting year, N = 184 CV/day. 1)
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- Compare the annual costs of a 2-lane road for two types of pavement a) structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per 1) km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- State methods of tunneling in soft rock. Explain with sketch any one b) method.
- C) Write short notes on:
 - **DBFOT** concept 1)
 - 2) **Tunnel Lining**



Values of L_x/l and L_y/l



SLR-FM-27 Set P

Figure-1







Seat

T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

No.

Q.1 Choose the correct alternatives from the options.

- 1) Essential requirement of soil properties which is used for subgrade construction are
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 2) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - 'Blowout' method C)
 - d) Combination of 'Blow in' and 'Blowout' methods
- 3) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is
 - a) 15.07cm 14.07cm b)
 - d) 17.07cm c) 16.07cm
- 4) Critical combination of stresses at edge in rigid pavement during summer mid-dav are.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- The main objective of prime coat is, __ 5)
 - a) Penetrate deep in to the pavement surface and plug the voids
 - Coat and bond the loose particles on the surface b)
 - c) Render the surface of the base course water resistant
 - d) All the above
- 6) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - Starting from the lower edge and proceeded towards the center c)
 - d) None of these

Max. Marks: 70

Marks: 14

- 7) In order to justify the proposed improvement, the benefit-cost ratio should be ____.
 - a) Less than 1.0
 - b) d) c) Between 0 to 1
- 8) In a district where the rainfall is heavy, a state highway of high type bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m b) 0.05 m
 - c) 0.07 m 0.06 m d)

9) The stopping sight distance depends upon _____

- a) total reaction time
- c) efficiency of brakes
- When the path travelled along the road surface is more than the circumferential 10) movement of the wheels due to rotation, then it results in _____.
 - a) Slipping b) Skidding
 - Revolving c) Turning d)
- 11) Match List-I with List-II and select the correct answer using the codes given below the lists.

List -1			List -1
Α	Penetration Test	1	Overlay Design
В	Marshal Test	2	Determination of Softening Point
С	Ring and Ball Test	3	Gradation of asphalt cement
D Benkelman Beam Test		4	Design of bituminous concrete mix
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4
c) A-3, B-2, C-4, D-1			d) A A-3, B-4, C-2, D-1

- On a single lane road with two-way traffic, the minimum stopping sight 12) distance is equal to _____.
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance
- The maximum allowable Los Angeles abrasion value for high quality 13) surface course is
 - a) 10%
 - 20% b) 45% c) 30% d)
- 14) Maximum number of vehicles can be parked with
 - a) parallel parking 30° angle parking b)
 - c) 45° angle parking 90° angle parking d)

- SLR-FM-27
 - Set

speed of vehicle

Greater than 1.0

Less than 0.5

- all of the above
- b)
- d)

Seat	
No.	

T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

07

14

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic. Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed?
- Write a detailed note on "Origin and Destination studies". c)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? C)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - 1) Initial Traffic in each direction on counting year, N = 184 CV/day.
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- Compare the annual costs of a 2-lane road for two types of pavement a) structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per 1) km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- State methods of tunneling in soft rock. Explain with sketch any one b) method.
- C) Write short notes on:
 - **DBFOT** concept 1)
 - 2) **Tunnel Lining**



SLR-FM-27

Set Q

SLR-FM-27 Set Q

Figure-1







T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – I

Day & Date: Monday,16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options.

- On a single lane road with two-way traffic, the minimum stopping sight distance is equal to _____.
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance
- 2) The maximum allowable Los Angeles abrasion value for high quality surface course is _____.
 - a) 10% b) 20%
 - c) 30% d) 45%
- 3) Maximum number of vehicles can be parked with _
 - a) parallel parking b) 30° angle parking
 - c) 45° angle parking d) 90° angle parking
- 4) Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 5) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods
- 6) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is _____.
 - a) 15.07cm b) 14.07cm
 - c) 16.07cm d) 17.07cm



Max. Marks: 70

Marks: 14

- Critical combination of stresses at edge in rigid pavement during summer mid-day are.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 8) The main objective of prime coat is, ____
 - a) Penetrate deep in to the pavement surface and plug the voids
 - b) Coat and bond the loose particles on the surface
 - c) Render the surface of the base course water resistant
 - d) All the above

7)

- 9) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these

a) total reaction time

- In order to justify the proposed improvement, the benefit-cost ratio should 10) be
 - a) Less than 1.0 b) Greater than 1.0
 - c) Between 0 to 1 d) Less than 0.5
- In a district where the rainfall is heavy, a state highway of high type 11) bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m b) 0.05 m
 - c) 0.07 m d) 0.06 m
- The stopping sight distance depends upon _____. 12)
 - b) speed of vehicle
 - efficiency of brakes all of the above C) d)
- When the path travelled along the road surface is more than the circumferential 13) movement of the wheels due to rotation, then it results in .
 - a) Slipping Skidding b)
 - c) Turning d) Revolving
- Match List-I with List-II and select the correct answer using the codes 14) given below the lists.

List -1			List -1
Α	Penetration Test	1	Overlay Design
В	Marshal Test	2	Determination of Softening Point
С	Ring and Ball Test	3	Gradation of asphalt cement
D Benkelman Beam Test		4	Design of bituminous concrete mix
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4

- c) A-3, B-2, C-4, D-1
- d) A A-3, B-4, C-2, D-1

Seat	
No.	

T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic. Speed of overtaking vehicle = 96 kmph. 1)

 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? 07
- Write a detailed note on "Origin and Destination studies". c)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? c)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - 1) Initial Traffic in each direction on counting year, N = 184 CV/day.
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- a) Compare the annual costs of a 2-lane road for two types of pavement structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- **b)** State methods of tunneling in soft rock. Explain with sketch any one method.
- c) Write short notes on:
 - 1) DBFOT concept
 - 2) Tunnel Lining





Set R

SLR-FM-27 Set R

Figure-1







T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 Civil Engineering

TRANSPORTATION ENGINEERING – I Day & Date: Monday,16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options.

- Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is _____.
 - a) 15.07cm b) 14.07cm
 - c) 16.07cm d) 17.07cm
- 2) Critical combination of stresses at edge in rigid pavement during summer mid-day are, _____.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 3) The main objective of prime coat is, _
 - a) Penetrate deep in to the pavement surface and plug the voids
 - b) Coat and bond the loose particles on the surface
 - c) Render the surface of the base course water resistant
 - d) All the above
- 4) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these
- 5) In order to justify the proposed improvement, the benefit-cost ratio should be _____.
 - a) Less than 1.0 b) Greater than 1.0
 - c) Between 0 to 1 d) Less than 0.5
- 6) In a district where the rainfall is heavy, a state highway of high type bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m b) 0.05 m
 - c) 0.07 m d) 0.06 m
- 7) The stopping sight distance depends upon ____
 - a) total reaction time b) speed of vehicle
 - c) efficiency of brakes d) all of the above





Max. Marks: 70

Marks: 14



- 8) When the path travelled along the road surface is more than the circumferential movement of the wheels due to rotation, then it results in _____.
 - a) Slipping

- b) Skidding
- c) Turning d) Revolving
- 9) Match List-I with List-II and select the correct answer using the codes given below the lists.

List -1			List -1
Α	Penetration Test	1	Overlay Design
В	Marshal Test	2	Determination of Softening Point
С	Ring and Ball Test	3	Gradation of asphalt cement
D	Benkelman Beam Test	4	Design of bituminous concrete mix
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4
c) A-3, B-2, C-4, D-1			d) A A-3, B-4, C-2, D-1

- 10) On a single lane road with two-way traffic, the minimum stopping sight distance is equal to _____.
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance
- 11) The maximum allowable Los Angeles abrasion value for high quality surface course is _____.
 - a) 10% b) 20%
 - c) 30% d) 45%
- 12) Maximum number of vehicles can be parked with ____
 - a) parallel parking b) 30° angle parking
 - c) 45° angle parking d) 90° angle parking
- 13) Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 14) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods

Seat	
No.	

T. E. (Part – I) (CBCS) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic.
 - Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? 07
- Write a detailed note on "Origin and Destination studies". c)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? C)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - 1) Initial Traffic in each direction on counting year, N = 184 CV/day.
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- a) Compare the annual costs of a 2-lane road for two types of pavement structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- b) State methods of tunneling in soft rock. Explain with sketch any one method.
- c) Write short notes on:
 - 1) DBFOT concept
 - 2) Tunnel Lining



S

SLR-FM-27

Set

SLR-FM-27 Set S

Figure-1







Sea No.	t				Set	Ρ				
	T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch)									
Day Time	& Date : 02:3	e: Thursday, 19-12-2019 0 PM To 04:30 PM	ICTION OF SC	JCIOLOGY Ma	ax. Marks	: 50				
Instr	uctio	ns: 1) Q.No.1 is compulso book 2) Figures to the right	ry and should be indicate full mark	e solved in first 20 minutes	s in answ	er				
Dura	tion: 2	0 Minutes			Marks	s: 10				
Q.1	Cho	ose the correct alternativ	ves from the opt	tions.		10				
	1)	The term sociology was g	jiven by							
		a) Herbert Spencer	b) d)	August Comte						
	2)	C) Rail Maix	u) terrelated and int							
	2)	a) Position	terrelated and In b)	Function						
		c) Role	d)	Person						
	3)	Urban societv is								
	,	a) Heterogeneous	b)	Homogeneous						
		c) Cultural	d)	Normative						
	4)	A family is unit.								
		a) Social	b)	Bilateral						
	_`	c) Cultural	a)	Unilateral						
	5)	Castes are group	9S.	Formal						
		c) Exogamous	(d (b	Endogamous						
	6)	The term Sanskritization	was diven hy	Lindegamede						
	0)	a) Ghurve	b)	 Mukheriee						
		c) Sriniwas	d)	Dr. Ambedkar						
	7)	The directions of social cl	hange are							
	,	a) Uncertain	b)	Certain						
		c) Positive	d)	Negative						
	8)	A Social movement runs	with							
		a) Media	b)	Ideology Dhilocombu						
	C)	C) Government	u)	Philosophy						
	9)	The process of socialization	on initiates at	stage.						
		c) Oedipal	(d d)	Adult						
	10)	Environmental science is	the study of							
	10)	a) Nature	b)	 Society						
		c) Diversity	d)	Srroundings						

Seat					Set	Ρ
		T.E. (Part IN	– I) (CBCS) Exa Self Learning TRODUCTION	amination Nov/Dec-2019 (All Branch) OF SOCIOLOGY)	
Day & Time Instr	& Da : 02:: uctic	te: Thursday, 19-1 30 PM To 04:30 P ons: 1) All questio 2) Figure to tl	2-2019 M ns are compulsory. ne right indicates fu	ıll marks.	Max. Marks	s: 40
Q.2	Wri a) b) c) d) e) f)	te answer on any Explain the mean Discuss on demo Elucidate nature a Explain the nature Give and account What is Human E	Four of the following and elements of graphic features of and types of social e and process of social of nature and type cology?	ving: of social structure. India. institutions. ocial change. es of social movements.		16
Q.3	a) b)	Explain the enviro	onmental changes	and related development in In OR on?	ndia.	12
Q.4	Wha	at the conventiona	I characteristics of	caste in India?		12

Seat No.								Set	Q	
			T.E. (Part IN	– I) (CB Self L ITRODU	CS) Exan earning (CTION O	nina All E F SC	tion Nov/Dec-2019 Branch) DCIOLOGY)		
Day & Date: Thursday, 19-12-2019 Max. Marks: 50 Time: 02:30 PM To 04:30 PM										
Instru	ictions	s: 1 2) Q.No.1 is book) Figures to	compulso	ry and shou indicate full	ıld be mark	e solved in first 20 minu ks.	ites in answ	er	
Durati	on [.] 20	Mi	nutes	Ũ				Marks	s [.] 10	
01			he correct	altornativ	us from th	o on	tions	maina	10	
Q. 1	1) T	he	term Sansk	ritization v	was aiven b	v V			10	
	, c	1) ;)	Ghurye Sriniwas		J	b) d)	Mukherjee Dr. Ambedkar			
4	2) T a c	The a) ;)	directions o Uncertain Positive	of social cł	nange are _	b) d)	 Certain Negative			
(3) A a c	A So i) ;)	ocial moven Media Governme	nent runs v nt	with	 b) d)	ldeology Philosophy			
2	4) T a c	⁻he າ) ະ)	process of Anal Oedipal	socializati	on initiates	at b) d)	stage. Oral Adult			
Ę	5) E a c	Envi 1) ;)	ronmental s Nature Diversity	science is	the study o	f b) d)	 Society Srroundings			
(6) T a c	The 1) ;)	term sociol Herbert Sp Karl Marx	ogy was g encer	iven by	b) d)	August Comte Max Weber			
7	7) S a c	Stat ı) ;)	us and Position Role	are in	terrelated a	nd in b) d)	terdepended. Function Person			
8	B) L a c	Jrba a) ;)	an society is Heterogen Cultural	6 eous		b) d)	Homogeneous Normative			
ę	9) A a c	A fai a) ;)	mily is Social Cultural	unit.		b) d)	Bilateral Unilateral			
	10) C a c	Cast i) ;)	tes are Religious Exogamou	group s	S.	b) d)	Formal Endogamous			

		SLR-F	М-	28				
Seat No.	:	Se	₽t	Q				
		T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY	_					
Day & Time	& Da : 02::	te: Thursday, 19-12-2019 Max. Ma 30 PM To 04:30 PM	ırks	: 40				
Instru	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.						
Q.2	Wri a) b) c) d) e) f)	te answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?		16				
Q.3	a)	Explain the environmental changes and related development in India. OR		12				
~ 4	b)	What are the agencies of socialization?		40				
Q.4	vvna	at the conventional characteristics of caste in India?	vvnat the conventional characteristics of caste in India?					

No.								Set	
T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch)									
Day a Time	& Date : 02:3	e: Thu 80 PM	rsday, 19- To 04:30 F	12-2019 PM				Max. Marks: 50)
Instr	uctio	ns: 1) 2)	Q.No.1 is book Figures to	compulsory a the right indio	nd shoul cate full r	d be nark	solved in first 20 min s.	utes in answer	
Dura	tion: 2	, 20 Min	utes	Ū				Marks: 10)
Q.1	Cho 1)	ose th The p	e correct	alternatives socialization i	from the nitiates a	opt t	ions. stage. 	10)
		c) (Oedipal			d)	Adult		
	2)	Envir a) N c) [onmental s Nature Diversity	cience is the	study of	b) d)	 Society Srroundings		
	3)	The te a) H c) H	erm sociolo Herbert Sp Karl Marx	ogy was giver encer	ו by	 b) d)	August Comte Max Weber		
	4)	Statu a) F c) F	s and Position Role	are interre	elated an	d int b) d)	erdepended. Function Person		
	5)	Urbar a) ł c) (n society is Heterogene Cultural	eous		b) d)	Homogeneous Normative		
	6)	A fam a) S c) (nily is Social Cultural	unit.		b) d)	Bilateral Unilateral		
	7)	Caste a) F c) E	es are Religious Exogamous	groups.		b) d)	Formal Endogamous		
	8)	The to a) (c) S	erm Sansk Ghurye Sriniwas	ritization was	given by	b) d)	 Mukherjee Dr. Ambedkar		
	9)	The c a) l c) l	directions o Uncertain Positive	f social chang	ge are	b) d)	 Certain Negative		
	10)	A Soc a) I c) (cial moverr Media Governmei	nent runs with nt		b) d)	ldeology Philosophy		

Set R

		SL	R-FM-	·28			
Seat No.	:		Set	R			
R		T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY					
Day & Time	& Da : 02:	ate: Thursday, 19-12-2019 Ma :30 PM To 04:30 PM	ax. Marks	s: 40			
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.					
Q.2	Wri a) b) c) d) e) f)	ite answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?		16			
Q.3	a)	Explain the environmental changes and related development in India OR	э.	12			
~ .	b)	What are the agencies of socialization?		4.0			
Q.4	What the conventional characteristics of caste in India? 12						

		T.E. (Part – I) (CBC Self Lea INTRODUC	S) Examination Nov/Dec-201 arning (All Branch) TION OF SOCIOLOGY	9				
Day Time	& Dat e: 02:3	e: Thursday, 19-12-2019 0 PM To 04:30 PM		Max. Marks: 50				
Instr	ructio	ns: 1) Q.No.1 is compulsory book	and should be solved in first 20 mir	utes in answer				
		2) Figures to the right inc	dicate full marks.					
Dura	tion: 2	20 Minutes		Marks: 10				
Q.1	Q.1 Choose the correct alternatives from the options.							
	1)	Urban society is a) Heterogeneous c) Cultural	b) Homogeneous d) Normative					
	2)	A family is unit. a) Social c) Cultural	b) Bilateral d) Unilateral					
	3)	Castes are groups. a) Religious c) Exogamous	b) Formal d) Endogamous					
	4)	The term Sanskritization wa a) Ghurye c) Sriniwas	is given by b) Mukherjee d) Dr. Ambedkar					
	5)	The directions of social cha a) Uncertain c) Positive	nge are b) Certain d) Negative					
	6)	A Social movement runs wit a) Media c) Government	th b) Ideology d) Philosophy					
	7)	The process of socialization a) Anal c) Oedipal	n initiates at stage. b) Oral d) Adult					
	8)	Environmental science is th a) Nature c) Diversity	e study of b) Society d) Srroundings					
	9)	The term sociology was give a) Herbert Spencer c) Karl Marx	en by b) August Comte d) Max Weber					
	10)	Status and are inter a) Position	rrelated and interdepended. b) Function					

Person

р) d) a) C) וו Role

Set S

Seat No.

. -_ . _
		SLR-FN	-28				
Seat No.		Set	S				
	T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY						
Day & Time	Day & Date: Thursday, 19-12-2019 Max. Marks: 40 Time: 02:30 PM To 04:30 PM Max. Marks: 40						
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.					
Q.2	Wri a) b) c) d) e) f)	te answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?	16				
Q.3	a)	Explain the environmental changes and related development in India. OR	12				
04	b)	What are the agencies of socialization?	12				
Q.4	V V I I 6	מנ נחפ לטחיפותטרומו טוומומטנפווטווט טו טמטנפ ווו וווטומ !	14				

-			7				
Seat No.						Set	Ρ
		T.E. (Par	t – I) (CBCS) Exa	amin	ation Nov/Dec-2019		
			Self Learning	(All	Branch)		
		PROFE	ESSIONAL ETHIC	CS &	HUMAN VALUES		
Day 8 Time:	& Date : 02:3	e: Thursday, 19 0 PM To 04:30	-12-2019 PM		Max.	Marks	s: 50
Instru	uctio	ns: 1) Q.No.1 is book.	s compulsory and sl	hould	be solved in first 20 minutes	in ans	swer
		2) Figures t	o the right indicate for	ull ma	rks.		
			MCQ/Objective	Туре	Questions		
Durat	ion: 2	20 Minutes				Marks	s: 10
Q.1	Cho	ose the correct	alternatives from	the o	otions.		10
	1)	a) Wise Peo c) Group of I	venare principies e ple People	b) d)	Based on their experience None of Above		
	2)	Ethics is the w a) Human te c) Only Valu	ord that refers to ndency es	 b) d)	Morals, values, and beliefs Psychology		
	3)	The study on e a) Learn goo c) Morality	ethics helps to know od or bad things	the pe b) d)	eople's Copyright Beliefs, values, and morals		
	4)	What is Integri a) Thought a c) Moral	ty? Ind words	b) d)	Honesty 15 years		
	5)	Work ethics is a) Motivation b) Set of attin c) Attitude d) Values	defined as a tudes concerned wit	h the [·]	value of work		
	6)	Many complex a) Industry/ I	social problems exi Business	ist in t b)	he Society		
	7)	 c) Home Virtues are a) Moral c) Values 		a) b) d)	Ethics positive and preferred values	s	
	8)	Honesty is a _ a) Virtue c) T trustwor	thiness	b) d)	Truthfulness Communication		
	9)	Courage is the a) elf-confide b) Risks and c) Physical c d) Social cou	e tendency to accept ence difficult tasks in rati courage urage	and f	ace vays		
	10)	Commitment n a) Alignment c) EMPATH	neans : to goals Y	b) d)	Adherence to ethical principl All the above	es	

Page **1** of **8**

			SLR-FM	-29
Sea No.	t		Set	Ρ
		T.E. (Part – I) (CBCS) Examination Nov/Dec-20 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES	19	
Day Time	& Dat : 02:3	te: Thursday, 19-12-2019 30 PM To 04:30 PM	Max. Marks	s: 40
Instr	uctio	2) All questions are compulsory.2) Figure to the right indicates full marks.		
Q.2	Wha	at are the Objectives of Engineering Ethics?		10
Q.3	Wha	at is the Difference Between Moral and Ethics? OR		10
	Wha	at is Value and Types of Values.		10
Q.4	Writ a) b) c) d) e)	te short notes on any four Moral Ethics Commitment Integrity Work Ethics		20

f) Virtues

			SELF LEARNING PROFESSIONAL ETHIC	(AL S &	L BRANCH) HUMAN VALUES			
Day	& Date	e: Th	ursday, 19-12-2019		Max. Marks: 50			
Time	: UZ:3		1 TO 04:30 PM					
Instr	uction	าร: 1) Q.No.1 is compulsory and she book.	buld	be solved in first 20 minutes in answer			
		2)) Figures to the right indicate ful	l ma	rks.			
			MCQ/Objective T	/pe (Questions			
Dura	tion: 2	0 Mi	nutes		Marks: 10			
Q.1	Choo	ose t	he correct alternatives from th	ne op	otions. 10			
	1)	Mar	ny complex social problems exis	t in tl	he			
		a)	Industry/ Business	b)	Society			
		c)	Home	d)	None of the above			
	2)	Virt	ues are	г)				
		a)	Moral	d)	Ethics			
	2)	C)		u)	positive and preferred values			
	3)	⊓or a)	Virtue	h)	Truthfulness			
		c)	T trustworthiness	d)	Communication			
4)		Cou	Courage is the tendency to accept and face					
		a) b) c)	Risks and difficult tasks in ratio	nal v	vays			
		d)	Social courage					
	5)	Cor	nmitment means					
		a) c)	Alignment to goals EMPATHY	b) d)	Adherence to ethical principles All the above			
	6)	Mor	als are the welfare principles en	uncia	ated by the			
		a)	Wise People	b)	Based on their experience			
		c)	Group of People	d)	None of Above			
	7)	Ethi	ics is the word that refers to	;				
		a)	Human tendency	b)	Morals, values, and beliefs			
	0)	6) The	only values	u)				
	8)	ine a)	study on ethics helps to know the	ne pe	eopie s Convright			
		а) с)	Morality	d)	Beliefs, values, and morals			
	9)	Wh:	at is Integrity?					
	0)	a)	Thought and words	b)	Honesty			
		c)	Moral	d)	15 years			
	10)	Woi a)	rk ethics is defined as a Motivation					
		b) c)	Set of attitudes concerned with Attitude	the	value of work			

Seat No.

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019

- d) Values



Set T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) **PROFESSIONAL ETHICS & HUMAN VALUES** Day & Date: Thursday, 19-12-2019 Max. Marks: 40 Time: 02:30 PM To 04:30 PM Instructions: 1) All questions are compulsory. 2) Figure to the right indicates full marks. Q.2 What are the Objectives of Engineering Ethics?

Q.3	What is the Difference Between Moral and Ethics?	
	OR	

What is Value and Types of Values.

Q.4 Write short notes on any four

a) Moral

Seat

No.

- Ethics b)
- C) Commitment
- Integrity d)
- Work Ethics e)
- **f**) Virtues

Q

10 10

10 20

Seat No.								Set	R
		•	T.E. (Part	– I) (CBCS)	Exami	ina	ation Nov/Dec-2019		
			Ś	ELF LEARN	ING (A		BRANCH)		
	Data	ть	PROFE	SSIONAL ET	HICS	&	HUMAN VALUES	Morika	
Day & Time:	02:30	PM	l To 04:30 F	PM			Max.	Marks	5:50
Instru	ctions	s: 1) Q.No.1 is	compulsory ar	nd shou	ld	be solved in first 20 minutes	in ans	swer
		2)	Figures to	the right indica	ate full m	nai	ks.		
				MCQ/Object	ive Typ	e (Questions		
Duratio	on: 20	Mi	nutes					Marks	s: 10
Q.1 (Choos	e t	he correct	alternatives fr	om the	op	otions.		10
	1) C	Cou	rage is the	tendency to ac	cept and	d fa	ace		
	a b	1)))	Risks and	difficult tasks in	rationa	l w	avs		
	С	;)	Physical co	ourage			,		
	d	1)	Social cour	age					
2	2) C	Con	nmitment m	eans	h	3	Adharanca to athical princip		
	C	a) 2)	EMPATHY	u yuais	d b	'))	All the above	162	
	3) N	Nor	als are the v	welfare principle	es enun	ncia	ated by the		
	a	a)	Wise Peop	le	b)	Based on their experience		
	С () Г	;) 	Group of P	eople	d	I)	None of Above		
2	4) E a	thi	cs is the wo Human ten	rd that refers to dency) h		Morals values and beliefs		
	C	,)	Only Value	S	d	l)	Psychology		
Ę	5) T	The	study on et	hics helps to kr	now the	pe	eople's		
	a	a)	Learn good	l or bad things	b)	Copyright		
G	2 2) V	/) //h/	worality	12	u)	Delleis, values, and morais		
C	o) v a	a)	Thought ar	nd words	b)	Honesty		
	С	;)	Moral		d	Í)	15 years		
7	7) V	Nor	k ethics is c	lefined as a	·				
	a b	a)	Motivation Set of attitu	ides concerner	l with th		value of work		
	c) Attitude								
	d) Values								
8	B) N	Mar	y complex :	social problems	s exist ir	n th	ne		
	a c	a) :)	Industry/ B Home	usiness	a b) }	Society None of the above		
ç	9) V	'' /irtu	les are		ŭ	·)			
	, a	a)	Moral		b)	Ethics		
	C	;)	Values		d	I)	positive and preferred value	S	
	10) F	Hon ما	esty is a Virtue	·	h)	Truthfulness		
	C	~)	T trustwort	niness	d	'))	Communication		

SLR-FM-29 _

Seat	
No	

c) T trustworthiness

		SLR-FM-	-29
Seat No.	t	Set	R
	T.E. (Part – I) (CBCS) Examination Nov/Dec Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VAL	:-2019 UES	
Day a Time	& Date: Thursday, 19-12-2019 e: 02:30 PM To 04:30 PM	Max. Marks	s: 40
Instr	'uctions: 1) All questions are compulsory.2) Figure to the right indicates full marks.		
Q.2	What are the Objectives of Engineering Ethics?		10
Q.3	What is the Difference Between Moral and Ethics? OR		10
	What is Value and Types of Values.		10
Q.4	 Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics 		20

f) Virtues

Seat								
No.						Set S		
T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 SELF LEARNING (ALL BRANCH) PROFESSIONAL ETHICS & HUMAN VALUES								
Day 8 Time:	Conte 02:30	e: Th 0 PN	ursday, 19- 1 To 04:30 F	12-2019 °M		Max. Marks: 50		
Instru	uctior	าร: 1) Q.No.1 is book.	compulsory an	d should	be solved in first 20 minutes in answer		
		2)	Figures to	the right indica	ite full ma	irks.		
				MCQ/Objecti	ve Туре	Questions		
Durat	ion: 2	0 Mi	nutes			Marks: 10		
Q.1	Choo	ose t	he correct	alternatives fro	om the o	ptions. 10		
	1)	The a) c)	Learn good Morality	hics helps to kr I or bad things	now the p b) d)	eople's Copyright Beliefs, values, and morals		
	2)	Wha a) c)	at is Integrity Thought ar Moral	y? nd words	b) d)	Honesty 15 years		
 Work ethics is de a) Motivation b) Set of attitue c) Attitude d) Values 			rk ethics is o Motivation Set of attitu Attitude Values	lefined as a udes concerned	 I with the	value of work		
	4)	Mar	y complex	social problems	exist in t	the		
		a) c)	Industry/ B Home	usiness	b) d)	Society None of the above		
	5)	Virtu a) c)	ues are Moral Values		b) d)	Ethics positive and preferred values		
	6)	Hon a) c)	esty is a Virtue T trustwort	 hiness	b) d)	Truthfulness Communication		
 7) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 				face ways				
	8)	Con a) c)	nmitment m Alignment EMPATHY	eans to goals	b) d)	Adherence to ethical principles All the above		
	9)	Mor a) c)	als are the Wise Peop Group of P	welfare principle le eople	es enunci b) d)	iated by the Based on their experience None of Above		
	10)	Ethi a) c)	cs is the wo Human ten Only Value	rd that refers to dency s) b) d)	Morals, values, and beliefs Psychology		

Seat No.

			SLR-FM	-29
Sea No.	t		Set	S
		T.E. (Part – I) (CBCS) Examination Nov/Dec- Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALU	2019 ES	
Day Time	& Da e: 02:	ite: Thursday, 19-12-2019 30 PM To 04:30 PM	Max. Marks	s: 40
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.		
Q.2	Wh	at are the Objectives of Engineering Ethics?		10
Q.3	Wh	at is the Difference Between Moral and Ethics? OR		10
	Wh	at is Value and Types of Values.		10
Q.4	Wri a) b) c) d) e)	ite short notes on any four Moral Ethics Commitment Integrity Work Ethics		20

f) Virtues

T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) **ECONOMICS**

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Duration: 20 Minutes

Set

No.

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

- Microeconomic theory deals with 1)
 - Economic behavior of individual economic decision making units a)
 - Economy as whole b)
 - Trade relations c)
 - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found
 - Private only Public only a) b)
 - None Both (a) private (b) public c) d)
- Who is known as father of economics? 3)
 - Prof. A. Samulson Adam Smith a) b) C) Alfred Marshall J. R. Hicks d)
- 4) Which of these is an economic activity?
 - Father teaching his son at home instead of spending on coaching a)
 - A housewife making food for the family on her own b)
 - A hair dresser doing hair cut designing on payment c)
 - A singer giving a show on his son's wedding anniversary d)
- Which of the following is true with respect to the law of diminishing 5) marginal utility?
 - The more the consumption, lesser the marginal utility from every a) additional unit consumed
 - The more the consumption, the greater the marginal utility from every b) additional unit consumed
 - The lesser the consumption, the lesser the marginal utility from every c) additional unit consumed
 - The lesser the consumption, no marginal utility from every additional d) unit consumed
- Which of the following is NOT an account in the Balance of Payments? 6)
 - Current Account Capital Account b) a)
 - **Financial Account** Future Account C) d)

Set

Max. Marks: 50

Marks: 10





- 7) The MPC can be defined as that fraction of a _____.
 - Change in income that is not consumed a)
 - Change in income that is consumed b)
 - Given total income that is not consumed c)
 - d) Given total income that is consumed
- 8) Which of the following market structures has a predominant feature of price leadership?
 - Perfectly competitive a) Oligopoly
- Monopoly b)
- Monopolistic competitive d)

Set

9) Average revenue is _____.

c)

- Total revenue divided by the number of units sold a)
- Revenue earned by all the units of the output b)
- Revenue earned by the average sized firm in the industry C)
- Net addition made to the total revenue by selling one more unit of a d) commodity
- 10) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _
 - The GDP of India and GNP of USA a)
 - b) Indian GNP and USA's GDP
 - India's GDP and USA's GDP c)
 - Indian GNP and USA's GNP d)

	Self Learning (All Branch) ECONOMICS	
Day Time	& Date: Thursday, 19-12-2019 e: 02:30 PM To 04:30 PM	Max. Marks: 40
Instr	cuctions: 1) Attempt any four questions out of question no. two to sever2) Figures at right indicate marks.	٦.
Q.2	Write short notes.a) Positive and Normative Economicsb) Saving and investment	10
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade	10
Q.4	Discuss the role of state government in economic activity.	10
Q.5	Explain the properties of perfect and imperfectly competitive market.	10
Q.6	What is mean by consumption? Illustrate the determinants of consumption	otion. 10
Q.7	Define central bank, discuss the function of central banking in India.	10

Seat No.

Set

T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) **ECONOMICS**

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options.

- Which of the following is NOT an account in the Balance of Payments? 1)
 - a) Current Account c) Financial Account
- b) Capital Account
- Future Account d)
- 2) The MPC can be defined as that fraction of a _____.
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - Given total income that is not consumed C)
 - Given total income that is consumed d)
- Which of the following market structures has a predominant feature of 3) price leadership?
 - Perfectly competitive a) c) Oligopoly
- b) Monopoly d) Monopolistic competitive
- 4) Average revenue is _
 - a) Total revenue divided by the number of units sold
 - Revenue earned by all the units of the output b)
 - Revenue earned by the average sized firm in the industry C)
 - Net addition made to the total revenue by selling one more unit of a d) commodity
- 5) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of
 - The GDP of India and GNP of USA a)
 - Indian GNP and USA's GDP b)
 - India's GDP and USA's GDP C)
 - Indian GNP and USA's GNP d)
- Microeconomic theory deals with 6)
 - Economic behavior of individual economic decision making units a)
 - b) Economy as whole
 - Trade relations c)
 - d) Economic growth of the society
- In a mixed economy which sector (s) is / are found _ 7)
 - a) Private only
 - None C)

- b) Public only
- d) Both (a) private (b) public



10

Max. Marks: 50

Set No.

SLR-FM-30 Set Q

- 8) Who is known as father of economics?
 - a) Adam Smith

- b) Prof. A. Samulson
- c) Alfred Marshall
- d) J. R. Hicks
- 9) Which of these is an economic activity?
 - a) Father teaching his son at home instead of spending on coaching
 - b) A housewife making food for the family on her own
 - c) A hair dresser doing hair cut designing on payment
 - d) A singer giving a show on his son's wedding anniversary
- 10) Which of the following is true with respect to the law of diminishing marginal utility?
 - a) The more the consumption, lesser the marginal utility from every additional unit consumed
 - b) The more the consumption, the greater the marginal utility from every additional unit consumed
 - c) The lesser the consumption, the lesser the marginal utility from every additional unit consumed
 - d) The lesser the consumption, no marginal utility from every additional unit consumed

	Self Learning (All Branch) ECONOMICS	
Day Time	& Date: Thursday, 19-12-2019 e: 02:30 PM To 04:30 PM	Max. Marks: 40
Instr	Puctions: 1) Attempt any four questions out of question no. two to seven2) Figures at right indicate marks.	n.
Q.2	Write short notes.a) Positive and Normative Economicsb) Saving and investment	10
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade	10
Q.4	Discuss the role of state government in economic activity.	10
Q.5	Explain the properties of perfect and imperfectly competitive market.	10
Q.6	What is mean by consumption? Illustrate the determinants of consumption	ption. 10
Q.7	Define central bank, discuss the function of central banking in India.	10

Set Q

Seat No.

Set R

Max. Marks: 50

T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Set

No.

Q.1 Choose the correct alternatives from the options.

- 1) Average revenue is ____
 - a) Total revenue divided by the number of units sold
 - b) Revenue earned by all the units of the output
 - c) Revenue earned by the average sized firm in the industry
 - d) Net addition made to the total revenue by selling one more unit of a commodity
- 2) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _____.
 - a) The GDP of India and GNP of USA
 - b) Indian GNP and USA's GDP
 - c) India's GDP and USA's GDP
 - d) Indian GNP and USA's GNP
- 3) Microeconomic theory deals with ____
 - a) Economic behavior of individual economic decision making units
 - b) Economy as whole
 - c) Trade relations

Private only

a)

- d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found _____
 - b) Public only
 - c) None d) Both (a) private (b) public
- 5) Who is known as father of economics?
 - a) Adam Smith b) Prof. A. Samulson
 - c) Alfred Marshall d) J. R. Hicks
- 6) Which of these is an economic activity?
 - a) Father teaching his son at home instead of spending on coaching
 - b) A housewife making food for the family on her own
 - c) A hair dresser doing hair cut designing on payment
 - d) A singer giving a show on his son's wedding anniversary

Marks: 10

- Page **8** of **12**

- 7) Which of the following is true with respect to the law of diminishing marginal utility?
 - a) The more the consumption, lesser the marginal utility from every additional unit consumed
 - b) The more the consumption, the greater the marginal utility from every additional unit consumed
 - c) The lesser the consumption, the lesser the marginal utility from every additional unit consumed
 - d) The lesser the consumption, no marginal utility from every additional unit consumed
- 8) Which of the following is NOT an account in the Balance of Payments?
 - a) Current Account b) Capita
 - c) Financial Account d) Fut
- 9) The MPC can be defined as that fraction of a _____.
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - c) Given total income that is not consumed
 - d) Given total income that is consumed
- 10) Which of the following market structures has a predominant feature of price leadership?
 - a) Perfectly competitive
 - c) Oligopoly

- b) Monopoly
- d) Monopolistic competitive

- b) Capital Account
- d) Future Account

Set R

Seat No.	t				Set	R
		T.E (Part	– I) (CBCS) Exa Self Learning ECON	amination Nov/Dec-2019 J (All Branch) OMICS		
Day & Time:	& Date : 02:30	: Thursday, 19-1) PM To 04:30 P	2-2019 M		Max. Marks	s: 40
Instru	uction	s: 1) Attempt an2) Figures at	y four questions o right indicate mark	ut of question no. two to sever <s.< td=""><td>٦.</td><td></td></s.<>	٦.	
Q.2	Write a) P b) S	short notes. Positive and Norr Paving and inves	mative Economics tment			10
Q.3	Write a) Ir b) Ir	short notes. mportance of Mo nternational Trac	oney in the econom de	ıy		10
Q.4	Discu	ss the role of sta	ate government in (economic activity.		10
Q.5	Expla	in the properties	of perfect and imp	perfectly competitive market.		10
Q.6	What	is mean by cons	sumption? Illustrate	e the determinants of consump	otion.	10
Q.7	Define	e central bank, d	liscuss the functior	n of central banking in India.		10

Set R

Max. Marks: 50

Set

T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) **ECONOMICS**

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Set

No.

Q.1 Choose the correct alternatives from the options.

- Who is known as father of economics? 1)
 - a) Adam Smith b)
 - Prof. A. Samulson C) Alfred Marshall d) J. R. Hicks
- 2) Which of these is an economic activity?
 - Father teaching his son at home instead of spending on coaching a)
 - A housewife making food for the family on her own b)
 - A hair dresser doing hair cut designing on payment c)
 - A singer giving a show on his son's wedding anniversary d)
- Which of the following is true with respect to the law of diminishing 3) marginal utility?
 - The more the consumption, lesser the marginal utility from every a) additional unit consumed
 - The more the consumption, the greater the marginal utility from every b) additional unit consumed
 - The lesser the consumption, the lesser the marginal utility from every C) additional unit consumed
 - The lesser the consumption, no marginal utility from every additional d) unit consumed
- Which of the following is NOT an account in the Balance of Payments? 4)
 - Capital Account a) Current Account b)
 - Future Account C) Financial Account d)
- 5) The MPC can be defined as that fraction of a _____
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - c) Given total income that is not consumed
 - Given total income that is consumed d)
- Which of the following market structures has a predominant feature of 6) price leadership?
 - Perfectly competitive a)
 - Oligopoly c)

- b) Monopoly
- Monopolistic competitive d)

Marks: 10

- 7) Average revenue is _____.
 - a) Total revenue divided by the number of units sold
 - b) Revenue earned by all the units of the output
 - c) Revenue earned by the average sized firm in the industry
 - d) Net addition made to the total revenue by selling one more unit of a commodity
- 8) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _____.
 - a) The GDP of India and GNP of USA
 - b) Indian GNP and USA's GDP
 - c) India's GDP and USA's GDP
 - d) Indian GNP and USA's GNP
- 9) Microeconomic theory deals with _____.
 - a) Economic behavior of individual economic decision making units
 - b) Economy as whole
 - c) Trade relations

Private only

- d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found _____.
 - b) Public only

c) None

a)

d) Both (a) private (b) public

SLR-FM-30

Set S

	ECONOMICS	
Day Time	& Date: Thursday, 19-12-2019 e: 02:30 PM To 04:30 PM	Max. Marks: 40
Instr	cuctions: 1) Attempt any four questions out of question no. two to sever2) Figures at right indicate marks.	n.
Q.2	Write short notes.a) Positive and Normative Economicsb) Saving and investment	10
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade	10
Q.4	Discuss the role of state government in economic activity.	10
Q.5	Explain the properties of perfect and imperfectly competitive market.	10
Q.6	What is mean by consumption? Illustrate the determinants of consum	ption. 10
Q.7	Define central bank, discuss the function of central banking in India.	10

Seat

No.

SLR-FM-30

Set S

Sea	It	Set	Ρ
NO.		T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch)	
Day Time	& Date	STRESS & COPING Thursday, 19-12-2019 Max. Marks PM To 04:30 PM	s: 50
Inst	ructior	 s: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answ book. 2) Firmers to the right in director full membres. 	/er
		2) Figure to the right indicates full marks.	
Dure	ntion: 2	Minutes	or 10
		windles water alternatives from the entions	5. 10 10
Q. 1	1)	Aches, shallow breathing and sweating, frequent colds are	10
		symptoms of stress. a) Physical b) Behavioral c) Emotional d) Cognitive	
	2)	Which one is not a characteristics of Positive Stress?a) It improves performanceb) It feels excitingb) It motivatesd) It's frustrating	
	3)	deals with prioritizing & scheduling the activities to cope up with nultiple job demands. a) Physical Exercise b) Time Management c) Wellness Programs d) Relaxation	
	4)	Which one is not an environmental stressor? a) Weather b) Traffic c) Financial problems d) Substandard housing	
	5)	Following are the examples of negative stressors. a) Unemployment b) Legal problems c) Divorce d) All of the above	
	6)	Which of the following is a stressful event? a) Birthday b) Studying c) Spouse death d) Vacation	
	7)	Stress which is healthy for organisation or for the individual is known as a) Eustress b) Distress c) Resistance d) None of these	<u> </u> .
	8)	Stress is a normal physical response to events that make a persona) Feels upsetb) Excitedc) Boringd) Happy	
	9)	is regarded as father of stress research. a) Hans Selye b) Sigmund Freud b) Atkinson Potter d) Mrunal Sengupta	
	10)	is an organizational way of managing stress. a) Job enlargement b) Jogging	

C) Job redesign d) Meditation

Seat			Set	Ρ
	T.E (Part	 – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING 		
Day & Time	& Date: Thursday, 19-7 : 02:30 PM To 04 :30 F	12-2019 PM	Max. Marks	s: 40
Instr	uctions: 1) Solve any 2) Figure to t	4 from Q. No. 2 to Q. No. 7. he right indicates full marks.		
Q.2	Individual can also ma	anage stress on their own. Explain.		10
Q.3	Explain in detail vario	us sources of stress.		10
Q.4	Whether optimal stres	ss can be effective. Explain this statement.		10
Q.5	Highlight the role of se	ocial support in minimizing the effects of stress.		10
Q.6	Define stress and stat	te the current and historical status of stress.		
Q.7	Explain the nature of	stress response.		10

Г

Soat						
No.			Set Q			
	T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING					
Day & Time:	& Date : 02:30	e: Thursday, 19-12-2019 0 PM To 04 :30 PM	Max. Marks: 50			
Instru	uctior	 ns: 1) Q.No.1 is compulsory and should be book. 2) Figure to the right indicates full mark 	solved in first 20 minutes in answer			
			unationa			
Durot	ion 0		uestions Markey 10			
Durat	.ion: 2		Warks: 10			
Q.1	1)	Which of the following is a stressful event a) Birthday b) c) Spouse death d)	Studying Vacation			
	2)	Stress which is healthy for organisation ora)Eustressb)b)c)Resistanced)	for the individual is known as Distress None of these			
	3)	Stress is a normal physical response to evala)Feels upsetb)b)c)Boringd)	vents that make a person Excited Happy			
	4)	is regarded as father of stress res a) Hans Selye b) c) Atkinson Potter d)	earch. Sigmund Freud Mrunal Sengupta			
	5)	is an organizational way of manag a) Job enlargement b) c) Job redesign d)	jing stress. Jogging Meditation			
	6)	Aches, shallow breathing and sweating, fro symptoms of stress. a) Physical b) c) Emotional d)	equent colds are Behavioral Cognitive			
	7)	Which one is not a characteristics of Posita) It improves performanceb)c) It motivatesd)	ive Stress? It feels exciting It's frustrating			
	8)	deals with prioritizing & scheduling multiple job demands. a) Physical Exercise b) c) Wellness Programs d)	the activities to cope up with Time Management Relaxation			
	9)	Which one is not an environmental stressa)Weatherb)c)Financial problemsd)	or? Traffic Substandard housing			
	10)	Following are the examples of negative stra)Unemploymentb)b)c)Divorced)	ressors. Legal problems All of the above			

Seat No.		Set	Q
	T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING)	
Day & Time	& Date: Thursday, 19-12-2019 : 02:30 PM To 04 :30 PM	Max. Marks	s: 40
Instr	uctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.		
Q.2	Individual can also manage stress on their own. Explain.		10
Q.3	Explain in detail various sources of stress.		10
Q.4	Whether optimal stress can be effective. Explain this statement.		10
Q.5	Highlight the role of social support in minimizing the effects of stress.		10
Q.6	Define stress and state the current and historical status of stress.		
Q.7	Explain the nature of stress response.		10

	T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING						
Day Time	Day & Date: Thursday, 19-12-2019 Max. Marks: 50 Time: 02:30 PM To 04 :30 PM						
Instr	uctio	ns: 1) Q.No.1 is compulsory and shou book.	ld be	solved in first 20 minutes in answer		
		2	2) Figure to the right indicates full	mark	KS.		
			MCQ/Objective Ty	pe Q	uestions		
Dura	tion: 2	20 Mi	nutes		Marks: 10		
Q.1	Cho 1)	ose t	the correct alternatives from the is regarded as father of stres	e op t s res	tions. 10 earch.		
		a) c)	Hans Selye Atkinson Potter	b) d)	Sigmund Freud Mrunal Sengupta		
	2)	a) c)	is an organizational way of m Job enlargement Job redesign	ianag b) d)	ying stress. Jogging Meditation		
	3)	Ach sym a) c)	es, shallow breathing and sweatii ptoms of stress. Physical Emotional	ng, fr b) d)	equent colds are Behavioral Cognitive		
	4)	Whi a) c)	ch one is not a characteristics of It improves performance It motivates	Posit b) d)	ive Stress? It feels exciting It's frustrating		
	5)	mult a) c)	deals with prioritizing & sched tiple job demands. Physical Exercise Wellness Programs	uling b) d)	the activities to cope up with Time Management Relaxation		
	6)	Whi a) c)	ch one is not an environmental st Weather Financial problems	resso b) d)	or? Traffic Substandard housing		
	7)	Follo a) c)	owing are the examples of negati Unemployment Divorce	ve st b) d)	ressors. Legal problems All of the above		
	8)	Whi a) c)	ch of the following is a stressful e Birthday Spouse death	vent' b) d)	? Studying Vacation		
	9)	Stre a) c)	ess which is healthy for organisation Eustress Resistance	on or b) d)	for the individual is known as Distress None of these		
	10)	Stre	ess is a normal physical response	to ev	ents that make a person		

Excited

Happy

b)

d)

Seat No.

SLR-FM-31

Set R

Feels upset c) Boring

a)

Seat No.		Set	R
	T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING)	
Day a Time	& Date: Thursday, 19-12-2019 : 02:30 PM To 04 :30 PM	Max. Marks	s: 40
Instr	uctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.		
Q.2	Individual can also manage stress on their own. Explain.		10
Q.3	Explain in detail various sources of stress.		10
Q.4	Whether optimal stress can be effective. Explain this statement.		10
Q.5	Highlight the role of social support in minimizing the effects of stress.		10
Q.6	Define stress and state the current and historical status of stress.		
Q.7	Explain the nature of stress response.		10

٦

SLR-FM-31

Г

T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) **STRESS & COPING**

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04 :30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figure to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

a)

2)

Seat

No.

Q.1 Choose the correct alternatives from the options.

- _ deals with prioritizing & scheduling the activities to cope up with 1) multiple job demands. b) Time Management
 - **Physical Exercise** a)

Weather

- Wellness Programs c)
- Which one is not an environmental stressor?
 - b) Traffic d) Substandard housing

d)

Relaxation

c) Financial problems

3) Following are the examples of negative stressors.

- Unemployment Legal problems a) b) Divorce All of the above c) d)
- Which of the following is a stressful event? 4)
 - Birthday Studying a) b)
 - Spouse death Vacation C) d)
- Stress which is healthy for organisation or for the individual is known as _____. 5)
 - a) Eustress b) Distress
 - C) Resistance d) None of these

6) Stress is a normal physical response to events that make a person _____.

Feels upset Excited a) b) c) Boring d) Happy

7) is regarded as father of stress research.

- Hans Selve Sigmund Freud a) b) c) Atkinson Potter d) Mrunal Sengupta
- is an organizational way of managing stress. 8)
 - Job enlargement a) b) Jogging Meditation c)
 - Job redesign d)
- 9) Aches, shallow breathing and sweating, frequent colds are _____ symptoms of stress.

b)

- a) Physical **Behavioral** b)
- Emotional d) Cognitive c)
- Which one is not a characteristics of Positive Stress? 10) It feels exciting
 - It improves performance a)
 - It motivates d) It's frustrating c)

SLR-FM-31

Set

Max. Marks: 50

Marks: 10

Seat No.		Set	S
	T.E (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING)	
Day & Time	& Date: Thursday, 19-12-2019 : 02:30 PM To 04 :30 PM	Max. Marks	5: 40
Instr	uctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.		
Q.2	Individual can also manage stress on their own. Explain.		10
Q.3	Explain in detail various sources of stress.		10
Q.4	Whether optimal stress can be effective. Explain this statement.		10
Q.5	Highlight the role of social support in minimizing the effects of stress.		10
Q.6	Define stress and state the current and historical status of stress.		
Q.7	Explain the nature of stress response.		10

	T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch)						
	INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN						
Day Time	& Date : 02:3	e: Th 0 PN	ursday, 19-12-2019 1 To 04:30 PM		Max. Marks: 50		
Instr	 structions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures al right indicate full marks 						
		2		το. Ο Ο Ι	uestions		
Dure	tion. C				Marka: 10		
Dura				1	imarks. 10		
Q.1	Cho 1)	The a) c)	first Patent Law was enacted in In 1856 1905	hdia i b) d)	n the year 1880 1850		
	2)	The Tecl a) b) c) d)	legislation covering intellectual prohology is Information Technology Act 2003 Information Technology Act 2000 Information Technology Act 2008 None of these	oper	ty right in India for Information		
	3)	Wha a) c)	at is copyright meant for? Film work Essay	b) d)	Books All of these		
	4)	Wha a) c)	at is the term of Patent? 35 years 20 years	b) d)	25 years 15 years		
	5)	Intel that a) c)	lectual Property Rights (IPR) prot are of Ethical value Social value	ect th b) d)	ne use of information and ideas Moral value Commercial value		
	6)	The a) c)	following can be patented Machine Composition of matter	b) d)	Process All of these		
	7)	The othe a) c)	following can not be exploited by ers Patents Trademark	assi(b) d)	gning or by licensing the rights to Designs All of these		
	8)	Wha a) c)	at protects the intellectual property Copyright Trademarks	/ crea b) d)	ated by artists? Patents Registered Designs		

Seat	
No.	

Set P

SLR-FM-32 Set P

- 9) If a company develops a new technology that improves its main product, what type of intellectual property can they use to stop others from copying their invention?
 - a) Copyright

b) Patents

c) Trademarks

- d) Registered Designs
- 10) All of the following are examples of intellectual property protections except _____.
 - a) Copyrights

b) Patents

c) Contracts

d) Trademarks

Sea No.	t					Set	Ρ
		T.E. (Part INTELLECTUA DE\	– I) (CBCS) Self Learn L PROPER ELOPMENT	Examination ing (All Bran IY RIGHTS F AND MANA	Nov/Dec-201 ch) OR TECHNO GEMETN	I9 LOGY	
Day Time Instr	& Da : 02 r ucti	ate: Thursday, 19- :30 PM To 04:30 F ons: 1) All questio	l2-2019 M ns are compuls	sory.		Max. Marks	s: 40
Q.2	Att a) b) c)	2) Figure to t empt following q What is intellectu Explain concept Compare the Ind	he right indicate Jestions (Any al property? Ho of valuation of I an IPR system	es full marks. Two) ow it is useful for P & value Reali: with internation	r Engineers? zation. al IPR framewo	rks.	20
Q.3	Wr a) b) c) d) e) f)	ite short notes (<i>A</i> Copy rights Commercialization Bio technology a Protection of Tra IPR & Electronic TRIPS & Access	Any Four) nd intellectual p ditional knowled Commerce to Medicines	property dge			20

٦

SLR-FM-32

E

					SLR	-FM-	-32
Seat No.						Set	Q
T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN							
Day & Date: Thursday, 19-12-2019 Max. Marks: Time: 02:30 PM To 04:30 PM							s: 50
Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.2) Figures al right indicate full marks.							
MCQ/Objective Type Questions							
Duration: 20 Minutes Marl							s: 10
Q.1	Cho 1)	ose the correct The following ca a) Machine c) Compositio	alternatives from th an be patented on of matter	e op [:] _b) _d)	tions. Process All of these		10
2	2)	The following ca others a) Patents c) Trademark	an not be exploited by	/ assi b) d)	gning or by licensing the rig Designs All of these	hts to	
ć	3)	What protects the intellectual property a) Copyright c) Trademarks			ated by artists? Patents Registered Designs		
2	4)	If a company develops a new technology that improves its main product, what type of intellectual property can they use to stop others from copying their invention? a) Copyright b) Patents c) Trademarks d) Registered Designs					
Ę	5)	All of the following are examples of intellectual property protections a) Copyrights b) Patents c) Contracts d) Trademarks				cept _	<u> </u>
e	6)	The first Patent a) 1856 c) 1905	Law was enacted in	India b) d)	in the year 1880 1850		
7	7)	 The legislation covering intellectual property right in India for Information Technology is a) Information Technology Act 2003 b) Information Technology Act 2000 c) Information Technology Act 2008 d) None of these 					
8	8)	What is copyrig a) Film work c) Essay	ht meant for?	b) d)	Books All of these		

- 9) What is the term of Patent?
 - a) 35 years c) 20 years

- b) 25 years
- 20 years d) 15 years
- 10) Intellectual Property Rights (IPR) protect the use of information and ideas that are of _____.
 - a) Ethical value
 - c) Social value

- b) Moral value
- d) Commercial value

Set Q

Set

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY **DEVELOPMENT AND MANAGEMETN**

Day & Date: Thursday, 19-12-2019 Max. Marks: 40 Time: 02:30 PM To 04:30 PM **Instructions:** 1) All questions are compulsory. 2) Figure to the right indicates full marks. Q.2 Attempt following questions (Any Two) 20 a) What is intellectual property? How it is useful for Engineers? b) Explain concept of valuation of IP & value Realization. c) Compare the Indian IPR system with international IPR frameworks. Q.3 Write short notes (Any Four) 20 Copy rights a) b) Commercialization c) Bio technology and intellectual property d) Protection of Traditional knowledge

Seat

No.

e) IPR & Electronic Commerce f) **TRIPS & Access to Medicines**

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures al right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- If a company develops a new technology that improves its main product, 1) what type of intellectual property can they use to stop others from copying their invention?
 - Copyright a)
 - Trademarks c) d)

2) All of the following are examples of intellectual property protections except .

b)

- Copyrights Patents a) b) c) Contracts d) Trademarks
- The first Patent Law was enacted in India in the year _____. 3)
 - 1856 1880 a) b)
 - C) 1905 d) 1850
- The legislation covering intellectual property right in India for Information 4) Technology is
 - Information Technology Act 2003 a)
 - Information Technology Act 2000 b)
 - Information Technology Act 2008 c)
 - None of these d)
- What is copyright meant for? 5)
 - Film work Books a) b) c) Essay d) All of these
- What is the term of Patent? 6)
 - 35 years a) b) 25 years 15 years 20 years d) C)
- Intellectual Property Rights (IPR) protect the use of information and ideas 7) that are of
 - a) Ethical value b) Moral value
 - Social value c) d) Commercial value
- 8) The following can be patented _____
 - Machine b) Process a)
 - C) Composition of matter d) All of these



SLR-FM-32

Set

Max. Marks: 50

Marks: 10
9) The following can not be exploited by assigning or by licensing the rights to others _____.

a) Patents

C)

10)

- b) Designsd) All of these
- Trademark d)
- What protects the intellectual property created by artists?
- a) Copyright

b) Patentsd) Registered Designs

SLR-FM-32

Set R

c) Trademarks

Set R

T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY **DEVELOPMENT AND MANAGEMETN**

Day & Date: Thursday, 19-12-2019 Max. Marks: 40 Time: 02:30 PM To 04:30 PM **Instructions:** 1) All questions are compulsory. 2) Figure to the right indicates full marks. Q.2 Attempt following questions (Any Two) 20 a) What is intellectual property? How it is useful for Engineers? b) Explain concept of valuation of IP & value Realization. c) Compare the Indian IPR system with international IPR frameworks. Q.3 Write short notes (Any Four) 20 Copy rights a) b) Commercialization c) Bio technology and intellectual property d) Protection of Traditional knowledge e) IPR & Electronic Commerce

TRIPS & Access to Medicines

Seat No.

- f)

				SLR-FM-32
Sea No.	t			Set S
		T.E. (Part – I) (CBCS) Exa Self Learning (INTELLECTUAL PROPERTY R DEVELOPMENT AN	mina (All E IGH D M <i>I</i>	tion Nov/Dec-2019 Branch) TS FOR TECHNOLOGY ANAGEMETN
Day Time	& Da e: 02::	te: Thursday, 19-12-2019 30 PM To 04:30 PM		Max. Marks: 50
Instr	ructio	ons: 1) Q. No. 1 is compulsory and sh book. 2) Figures al right indicate full ma	ould arks.	be solved in first 20 minutes in answer
		MCQ/Objective Ty	/pe Q	uestions
Dura	tion:	20 Minutes		Marks: 10
Q.1	Cho	oose the correct alternatives from th	ne op	tions. 10
	1)	What is copyright meant for? a) Film work c) Essay	b) d)	Books All of these
	2)	What is the term of Patent? a) 35 years c) 20 years	b) d)	25 years 15 years
	3)	Intellectual Property Rights (IPR) pro that are of a) Ethical value c) Social value	btect t b) d)	he use of information and ideas Moral value Commercial value
	4)	 a) Machine c) Composition of matter 	 b) d)	Process All of these
	5)	The following can not be exploited by others a) Patents c) Trademark	y assi b) d)	igning or by licensing the rights to Designs All of these
	6)	What protects the intellectual proper a) Copyright c) Trademarks	ty cre b) d)	ated by artists? Patents Registered Designs
	7)	If a company develops a new techno what type of intellectual property can their invention? a) Copyright c) Trademarks	blogy they b) d)	that improves its main product, use to stop others from copying Patents Registered Designs
	8)	All of the following are examples of in a) Copyrights c) Contracts	ntelle b) d)	ctual property protections except Patents Trademarks
	9)	The first Patent Law was enacted in a) 1856 c) 1905	India b) d)	in the year 1880 1850

10) The legislation covering intellectual property right in India for Information Technology is _ chnology is _____. Information Technology Act 2003 Information Technology Act 2000

- a)
- b)
- Information Technology Act 2008 c)
- d) None of these

SLR-FM-32

Set S

Seat No.	t		Set	S
		T.E. (Part – I) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOL DEVELOPMENT AND MANAGEMETN	OGY	
Day a Time	& Da : 02	ate: Thursday, 19-12-2019 30 PM To 04:30 PM	Max. Marks	s: 40
Instr	ucti	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.		
Q.2	Att a) b) c)	empt following questions (Any Two) What is intellectual property? How it is useful for Engineers? Explain concept of valuation of IP & value Realization. Compare the Indian IPR system with international IPR frameworks	S.	20
Q.3	Wr a) b) c) d) e) f)	ite short notes (Any Four) Copy rights Commercialization Bio technology and intellectual property Protection of Traditional knowledge IPR & Electronic Commerce TRIPS & Access to Medicines		20

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) In section II, Solve any three questions.
- 4) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Dura	tion: 3	30 Minutes		Mark	s: 14			
Q.1	Choose the correct alternatives from the options and rewrite the sentence.							
	1)	Compatibility conditions are essentian a) Substitute frame c) Redundant frame	ally re b) d)	equired to solve, Complex frame Compound truss	01			
	2)	 Which one of the fallowing doesn't fall	all un	der category of force method?	01			
	3)	Flexibility coefficient of beam shown	n in fig	g 1 is	01			
		a) $\frac{L^2}{2 EI}$ c) $\frac{L^3}{4 EI}$	b) d)	$ \frac{L^3}{3 EI} $ $ \frac{L^3}{6 EI} $				
	4)	Expression given by Castigliano's the point in structure is a) $\int \frac{M}{FI} x \frac{\partial M}{\partial n}$	b)	m to determine deflection of any $\int \frac{\partial M}{\partial n} \frac{dx}{FI}$	01			



SLR-FM-33

Set P

Max. Marks: 70

	Set	Ρ
5)	Degree of static indeterminacy of beam (neglecting A.F) shown in fig 2.	01
	Fig 2 a) 1 b) 3 c) 2 d) 4	
6)	Degree of kinematic indeterminacy of truss shown in fig 3.	01
	a) 3 b) 5 c) 6 d) 2	
7)	The flexibility matrix isa) Symmetricb) Unsymmetricc) triangulard) none of these	01
8)	Due to sinking of support by ' δ ', the moment developed is a) $6EI\delta/L3$ b) $12EI\delta/L3$ c) $6EI\delta/L2$ d) $6EI\delta/L$	01
9)	 In portal frames, sway is produced due to a) Eccentric loading on frame b) Horizontal loading on column c) Different end conditions of columns d) All of the above 	01
10)	Shape of ILD for indeterminate structure is a) Linear b) Nonlinear c) Triangular d) All of the above	01
11)	Size of stiffness matrix for propped cantilever beam isa) 2 X 2b) 3 X 3c) 4 X 4d) None of these	01
12)	Mullar Breslau principle for influence line is applicable fora) Simple beamb) Continuous beamc) Redundant trussd) all of these	01
13)	Size of Stiffness matrix for frame as shown in fig. is a) 3×3 b) 4×4 c) 2×2 d) 1×1 4 - 4m(2l) - 6m(l) - 5m(l) 5m(l) - 5m(l) - 5m(l) - 5m(l)	02

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 2) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve any four.

- a) Define static and kinematic indeterminacy with examples.
- b) Differentiate between flexibility and stiffness method.
- c) Enlist various methods of force method of analysis.

30 kN/m

- d) Explain Castigliano's theorem for solving indeterminate beams.
- e) Enlist various methods of Displacement method of analysis.
- Q.3 Analyse the continuous beam using Consistent Deformation method. Support B 09 sinks by 10mm. El= 75000 kNm². Refer Fig 4.

40 kN/m



Q.4 Draw SFD and BMD using Strain Energy method. Refer Fig 5.



Q.5 Analyze the beam using flexibility method. Refer Fig. 6



Max. Marks: 56

SLR-FM-33

Set

09

09

Section – II

Q.6 Analyze the beam using Moment Distribution method Refer fig.7



Q.7 Analyze Continuous Beam and draw S.F and B.M Diagram Using StiffnessO9 Method Refer fig.8



Q.8 Draw B.M.D. Use Stiffness Method. Refer fig. 9



Q.9 Draw ILD for BM and SF at point D. Refer Fig.10





09

10

09

Ρ

SLR-FM-33

Set

Seat No.

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Duration: 30 Minutes

Instructions: 1) Q. No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) In section II, Solve any three questions.
- 4) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Q.1	Choo sent	ose the correct alternatives from the options and rewrite the					
	1)	Due to sinking of support by ' δ ', the moment developed is a) $6EI\delta/L3$ b) $12EI\delta/L3$ c) $6EI\delta/L2$ d) $6EI\delta/L$	01				
	2)	 In portal frames, sway is produced due to a) Eccentric loading on frame b) Horizontal loading on column c) Different end conditions of columns d) All of the above 					
	3)	Shape of ILD for indeterminate structure isa) Linearb) Nonlinearc) Triangulard) All of the above	01				
	4)	Size of stiffness matrix for propped cantilever beam isa) 2 X 2b) 3 X 3c) 4 X 4d) None of these	01				
	5)	Mullar Breslau principle for influence line is applicable fora) Simple beamb) Continuous beamc) Redundant trussd) all of these	01				
	6)	Compatibility conditions are essentially required to solve,a) Substitute frameb) Complex framec) Redundant framed) Compound truss	01				
	7)	 Which one of the fallowing doesn't fall under category of force method? a) Consistent deformation method b) Flexibility method c) Stiffness method d) Energy method 	01				

Marks: 14

Max. Marks: 70

Set Q



T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 2) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve any four.

- a) Define static and kinematic indeterminacy with examples.
- b) Differentiate between flexibility and stiffness method.
- c) Enlist various methods of force method of analysis.
- d) Explain Castigliano's theorem for solving indeterminate beams.
- e) Enlist various methods of Displacement method of analysis.
- Q.3 Analyse the continuous beam using Consistent Deformation method. Support B 09 sinks by 10mm. El= 75000 kNm². Refer Fig 4.



Q.4 Draw SFD and BMD using Strain Energy method. Refer Fig 5.



Q.5 Analyze the beam using flexibility method. Refer Fig. 6



Max. Marks: 56

10

09

09



Set

Q



Section – II

Q.6 Analyze the beam using Moment Distribution method Refer fig.7



Q.7 Analyze Continuous Beam and draw S.F and B.M Diagram Using StiffnessO9 Method Refer fig.8



Q.8 Draw B.M.D. Use Stiffness Method. Refer fig. 9



Q.9 Draw ILD for BM and SF at point D. Refer Fig.10



09

10

09

Q

SLR-FM-33

Set

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS - III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Duration: 30 Minutes

Instructions: 1) Q. No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) In section II, Solve any three questions.
- 4) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Q.1	Choose the correct alternatives from the options and rewrite the sentence.						
	1)	Size of stiffness matrix for propped cantilever beam isa) 2 X 2b) 3 X 3c) 4 X 4d) None of these	01				
	2)	Mullar Breslau principle for influence line is applicable fora) Simple beamb) Continuous beamc) Redundant trussd) all of these	01				
	3)	Compatibility conditions are essentially required to solve,a) Substitute frameb) Complex framec) Redundant framed) Compound truss	01				
	4)	 4) Which one of the fallowing doesn't fall under category of force method? a) Consistent deformation method b) Flexibility method c) Stiffness method d) Energy method 					
	5)	Flexibility coefficient of beam shown in fig 1 is a) $\frac{L^2}{2 EI}$ b) $\frac{L^3}{3 EI}$	01				
		c) $\frac{L^3}{4 EI}$ d) $\frac{L^3}{6 EI}$					

Seat No.

SLR-FM-33

Set

Max. Marks: 70

R

Marks: 14



Part – II) (New) (CBCS) Examination Nov

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 2) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve any four.

- a) Define static and kinematic indeterminacy with examples.
- b) Differentiate between flexibility and stiffness method.
- c) Enlist various methods of force method of analysis.
- d) Explain Castigliano's theorem for solving indeterminate beams.
- e) Enlist various methods of Displacement method of analysis.
- Q.3 Analyse the continuous beam using Consistent Deformation method. Support B 09 sinks by 10mm. El= 75000 kNm². Refer Fig 4.



Q.4 Draw SFD and BMD using Strain Energy method. Refer Fig 5.



Q.5 Analyze the beam using flexibility method. Refer Fig. 6



Max. Marks: 56

SLR-FM-33

Set

10

09

Section – II

Q.6 Analyze the beam using Moment Distribution method Refer fig.7



Q.7 Analyze Continuous Beam and draw S.F and B.M Diagram Using StiffnessO9 Method Refer fig.8



Q.8 Draw B.M.D. Use Stiffness Method. Refer fig. 9



Q.9 Draw ILD for BM and SF at point D. Refer Fig.10



10

09

09

R

SLR-FM-33

Set

Seat No. T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS - III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) In section II, Solve any three questions.
- 4) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Dura	ition: 3	30 Minutes	Marks: 14				
Q.1	Choose the correct alternatives from the options and rewrite the sentence.						
	1)	Degree of kinematic indeterminacy of truss shown in fig 3.	01				
		a) 3 c) 6 b) 5 d) 2					
	2)	The flexibility matrix isa) Symmetricb) Unsymmetricc) triangulard) none of these	01				
	3)	Due to sinking of support by ' δ ', the moment developed isa) $6EI\delta/L3$ b) $12EI\delta/L3$ c) $6EI\delta/L2$ d) $6EI\delta/L$	<u>.</u> 01				
	4)	 In portal frames, sway is produced due to a) Eccentric loading on frame b) Horizontal loading on column c) Different end conditions of columns d) All of the above 	01				
	5)	Shape of ILD for indeterminate structure isa) Linearb) Nonlinearc) Triangulard) All of the above	01				
	 6) Size of stiffness matrix for propped cantilever beam is a) 2 X 2 b) 3 X 3 c) 4 X 4 d) None of these 						
	7)	Mullar Breslau principle for influence line is applicable fora) Simple beamb) Continuous beamc) Redundant trussd) all of these	. 01				

SLR-FM-33

Max. Marks: 70

Set S



T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Questions No.2 is Compulsory. and attempt any two questions from remaining to Q.3 to Q.5 section I.

- 2) Questions No.8 is Compulsory. and attempt any two questions from remaining to Q.6, Q.7 and Q.9 section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve any four.

- a) Define static and kinematic indeterminacy with examples.
- b) Differentiate between flexibility and stiffness method.
- c) Enlist various methods of force method of analysis.
- d) Explain Castigliano's theorem for solving indeterminate beams.
- e) Enlist various methods of Displacement method of analysis.
- Q.3 Analyse the continuous beam using Consistent Deformation method. Support B 09 sinks by 10mm. El= 75000 kNm². Refer Fig 4.



Q.4 Draw SFD and BMD using Strain Energy method. Refer Fig 5.



Q.5 Analyze the beam using flexibility method. Refer Fig. 6



Max. Marks: 56

10

09

09



Set

S

Section - II

Q.6 Analyze the beam using Moment Distribution method Refer fig.7



Q.7 Analyze Continuous Beam and draw S.F and B.M Diagram Using StiffnessO9 Method Refer fig.8



Q.8 Draw B.M.D. Use Stiffness Method. Refer fig. 9



Q.9 Draw ILD for BM and SF at point D. Refer Fig.10



09

10

09

S

SLR-FM-33

Set

Seat No.

> T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

14

- Q.1 Choose the correct alternatives from the options and rewrite the sentences.
 - 1) RQD is the ratio of _____
 - a) Sum of lengths of rock core pieces greater than 15 cm to the total length of core run
 - b) Sum of lengths of rock core pieces greater than 10 cm to the total length of core run
 - c) Sum of lengths of rock core pieces to the total length of core run
 - d) Sum of lengths of unbroken rock core pieces to the total length of core run
 - 2) One of the purposes of Soil exploration is _____.
 - a) To understand the behaviour of the structure
 - b) To estimate the load coming on the soil
 - c) To find the quantity and quality of water
 - d) To determine basic properties of soil
 - 3) Which one of the following is not the assumption made in Terazaghi's bearing capacity analysis?
 - a) The strip footing has rough base
 - b) Failure zone do not extend above the horizontal plane through the base of the footing
 - c) Plastic zone is not fully developed
 - d) The elastic zone has straight boundaries
 - According to IS: 1904 1966, maximum safe bearing capacity for coarse sand, medium sand and fine sand are respectively (in kg/cm²)
 - a) 4.5, 2.5, 1.5 b) 33, 16.5, 9
 - c) 16.5, 9.0, 4.5 d) None of these
 - 5) The allowable soil pressure for foundation in cohesive soil is generally controlled by _____.
 - a) Settlements b) Bearing capacity
 - c) both (a) and (b) d) neither (a) nor (b)
 - 6) How much is the drive weight used in Standard Penetration test as per IS 2131: 1981?
 - a) 53.5 kg b) 63.5 kg c) 73.5 kg d) 83.5 kg

Set P

Max. Marks: 70

SLR-FM-34 Set 7) In case of plate load test seating load to be applied is _____. a) 5 kPa b) 10 kPa C) 7 kPa d) None Curb is a component in case of _____. 8) b) Pneumatic caisson Box caisson a) C) Open caisson d) All These types of soil deposits are often found near the mouths of rivers, 9) along the perimeters of bays and beneath swamps or lagoons _____. a) Weak/compressible soil b) Collapsible soil C) Expansive soil d) Corrosive soil 10) The negative skin friction on a pile develops when _____. The soil in which it is driven is sandy soil a) The soil surrounding it settles more than the pile b) C) The ground water table rises The soil near the tip is clay d) 11) The group efficiency of driven piles in sand at a close spacing may be . Equal to 100% Greater than 100% a) b) Below 100% d) None of the above C) In stability analysis, the term mobilized shear strength is referred to as _____. 12) Maximum shear stress Shear strength a) b) C) Applied shear stress d) None Taylor's stability charts are based on the total stress using the _____. 13) a) Friction circle method b) Method of slices $\phi u = 0$ analysis d) None c) 14) Which of the following geosynthetic material acts as separator _____. Geomat Geocells a) b) d)

Geotextiles C)

Geofoam

Max. Marks: 56

Seat	
No.	

Set P

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.

- 2) Q.6 is compulsory; answer any two from remaining questions from Section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

Q.2	a) b)	With a neat sketch explain borelog chart. Determine the ultimate bearing capacity of square footing of 1.5 m size, at a depth of 1.5 m, in a pure clay with an unconfined strength of 150 kN/m ² . $\phi = 0^0$ and $\gamma = 17$ kN/m ³ , Take Nc = 5.7, Nq = 1.0, and N $\gamma = 0$	04 06
Q.3	a) b)	Enlist the difference between general shear failure and Local shear failure. Determine the allowable gross load and net allowable load of square footing of 2m side and With a depth of foundation 1.0 m. use Terzaghi's bearing capacity theory and assume local Shear failure, take factor of safety 3.0, the soil at the site has $\gamma = 18 \text{ kN/m}^3$, $c = 15 \text{ kN/m}^2$ And $\phi = 25^0$, Take Nc = 14.8, Nq = 5.6, and N $\gamma = 3.2$	03 06
Q.4	a) b)	Explain the procedure of Plate load test with neat sketches. Calculate the consolidation settlement of a clay layer of 12 m thick with initial void ratio of 0.90. The unit weight of clay is 18 kN/m ³ and liquid limit of undisturbed soil is 60%. Foundation load will subject the center of layer to a vertical stress increase of 10 kPa.	05 04
Q.5	a) b)	Explain uses of geotextiles in road construction with neat sketches. What is collapsible soil? What are the precautions of be taken before starting of construction in collapsible soil?	04 05

Section – II

- 04 Q.6 Write short note on Negative skin friction. a) Design a strap footing for two columns using following data. 06 b) Load carried by external column is 2800 kN and that by internal column is 4250 kN c/c Spacing between the columns is 6.8 m, size of each column is 450 mm \times 450 mm and External column is at a distance of 280 mm from the boundary. Assume allowable soil pressure is 325 kN/m². Q.7 A reinforced cement concrete pile weighing 30kN (including helmet and 06 a) dolly) is driven by a drop hammer weighing 30 kN with an effective fall of
 - 0.9 m. the average penetration per blow is 15mm. the total temporary elastic compression of the pile, pile cap and soil may be taken as 18 mm. coefficient of restitution 0.36, what is the allowable load on the pile with a factor of safety 2.0, Use Haley's formula.
 - **b)** List out the types of Caissons.

		SLR-FM-	34
		Set	Ρ
Q.8	a) b)	Design sheet pile wall for a height of 5.0 m in sandy soil and supporting sandy soil having $\gamma = 16 \text{ kN/m}^3$, c = 0kN/m ² and $\phi = 30^0$. Also draw the sketch of wall with design details. Write a brief critical note on 'Taylor's Stability Number'	06 03
Q.9	a) b)	Draw a neat labeled sketch of a slope and enlist causes of failure of slope. Briefly explain the procedure of friction circle method to determine stability of slopes	03 06

Seat No.								Set	Q
	•	T.E.	(Part - II)	(New) (C Civ	BCS) Ex	amir eerin	nation Nov/Dec-201 a	9	
			GE	OTECHN		GINE	ERING – II		
Day & Time:	Date 10:00	e: Sat D AM	urday, 23-1 To 01:00 F	1-2019 M			Ma	ax. Marks	: 70
Instru	ctior	is: 1)	Q. No. 1 is book.	s compulsor	y and shou	ıld be	solved in first 30 minute	es in ansv	ver
		2) 3)	Figures to Assume a	the right ind dditional da	dicate full n ta if require	narks. ed and	d mention it clearly.		
		,		MCQ/Obj	ective Typ	e Qu	estions		
Durati	on: 3	0 Min	utes					Marks	5: 14
Q.1 (Choo	se th	e correct a	alternatives	s from the	optio	ons and rewrite the		14
	1)	Curb a) c)	is a compo Box caisso Open cais	onent in cas on son	e of	 b) d)	Pneumatic caisson All		
2	2)	Thes along a) c)	e types of s the perim Weak/com Expansive	soil deposits eters of bay pressible so soil	s are often rs and bene oil	founc eath s b) d)	I near the mouths of rive wamps or lagoons Collapsible soil Corrosive soil	ers, 	
(3)	The i a) b) c) d)	negative sk The soil in The soil su The groun The soil ne	kin friction or which it is ourrounding it water table ar the tip is	n a pile dev driven is sa t settles mo le rises s clay	velops andy s ore that	s when oil an the pile		
2	4)	The g a) c)	group effici Equal to 1 Below 100	ency of driv 00%)%	en piles in	sand b) d)	at a close spacing may Greater than 100% None of the above	be	_·
Į	5)	In sta a) c)	ability analy Shear stre Applied sh	/sis, the terr ength near stress	n mobilized	d shea b) d)	ar strength is referred to Maximum shear stress None	as	
(6)	Taylo a) c)	or's stability Friction cir φu = 0 an	/ charts are cle method alysis	based on t	he tot b) d)	al stress using the Method of slices None		
-	7)	Whic a) c)	h of the fol Geocells Geotextile	lowing geos s	synthetic m	ateria b) d)	l acts as separator Geomat Geofoam		
8	3)	RQD a)	is the ration Sum of ler length of c	o of ngths of rocl core run	k core piec	es gre	eater than 15 cm to the	total	
		b) c)	Sum of ler length of c Sum of ler	ngths of rock ore run ngths of rock	< core piec	es gre es to	eater than 10 cm to the t	total run	

Sum of lengths of unbroken rock core pieces to the total length of d) core run

SLR-FM-34

٦

Т

- SLR-FM-34 Set | Q
- 9) One of the purposes of Soil exploration is .
 - To understand the behaviour of the structure a)
 - To estimate the load coming on the soil b)
 - To find the quantity and quality of water c)
 - To determine basic properties of soil d)
- 10) Which one of the following is not the assumption made in Terazaghi's bearing capacity analysis?
 - The strip footing has rough base a)
 - Failure zone do not extend above the horizontal plane through the b) base of the footing
 - Plastic zone is not fully developed c)
 - The elastic zone has straight boundaries d)
- According to IS: 1904 1966, maximum safe bearing capacity for coarse 11) sand, medium sand and fine sand are respectively (in kg/cm^2)
 - 4.5, 2.5, 1.5 33, 16.5, 9 a) b)
 - c) 16.5, 9.0, 4.5 d) None of these
- The allowable soil pressure for foundation in cohesive soil is generally 12) controlled by _
 - Settlements a)
- b) Bearing capacity
- c) both (a) and (b)
- neither (a) nor (b) d)
- How much is the drive weight used in Standard Penetration test as per 13) IS 2131: 1981?
 - a) 53.5 kg b) 63.5 kg
 - C) 73.5 kg d) 83.5 kg
- In case of plate load test seating load to be applied is _____. 14)
 - 5 kPa a) b) d)
 - c) 7 kPa

10 kPa None

|--|

Set

Max. Marks: 56

Q

Saat	
Jeal	
NT -	
NO.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering GEOTECHNICAL ENGINEERING – II**

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.

- 2) Q.6 is compulsory; answer any two from remaining questions from Section – II.
- 3) Figures to the right indicate full marks.
- Assume additional data if required and mention it clearly.

Section – I

Q.2 With a neat sketch explain borelog chart. 04 a) Determine the ultimate bearing capacity of square footing of 1.5 m size, at b) 06 a depth of 1.5 m, in a pure clay with an unconfined strength of 150 kN/m^2 . $\phi = 0^{0}$ and $\gamma = 17$ kN/m³, Take Nc = 5.7, Ng = 1.0, and Ny = 0 Q.3 Enlist the difference between general shear failure and Local shear failure. 03 a) Determine the allowable gross load and net allowable load of square 06 b) footing of 2m side and With a depth of foundation 1.0 m. use Terzaghi's bearing capacity theory and assume local Shear failure, take factor of safety 3.0, the soil at the site has $\gamma = 18 \text{ kN/m}^3$, $c = 15 \text{ kN/m}^2$ And $\phi = 25^{\circ}$, Take Nc = 14.8, Ng = 5.6, and N $\gamma = 3.2$ Explain the procedure of Plate load test with neat sketches. Q.4 05 a) Calculate the consolidation settlement of a clay layer of 12 m thick with 04 b) initial void ratio of 0.90. The unit weight of clay is 18 kN/m³ and liquid limit of undisturbed soil is 60%. Foundation load will subject the center of layer to a vertical stress increase of 10 kPa. Q.5 Explain uses of geotextiles in road construction with neat sketches. 04 a) What is collapsible soil? What are the precautions of be taken before 05 b) starting of construction in collapsible soil? Section – II 04 Q.6 a) Write short note on Negative skin friction. Design a strap footing for two columns using following data. 06 b) Load carried by external column is 2800 kN and that by internal column is 4250 kN c/c Spacing between the columns is 6.8 m, size of each column is 450 mm \times 450 mm and External column is at a distance of 280 mm from the boundary. Assume allowable soil pressure is 325 kN/m^2 .

- Q.7 A reinforced cement concrete pile weighing 30kN (including helmet and 06 a) dolly) is driven by a drop hammer weighing 30 kN with an effective fall of 0.9 m. the average penetration per blow is 15mm. the total temporary elastic compression of the pile, pile cap and soil may be taken as 18 mm. coefficient of restitution 0.36, what is the allowable load on the pile with a factor of safety 2.0, Use Haley's formula.
 - **b)** List out the types of Caissons.

		SLR-FM-	34
		Set	Q
Q.8	a) b)	Design sheet pile wall for a height of 5.0 m in sandy soil and supporting sandy soil having $\gamma = 16 \text{ kN/m}^3$, c = 0kN/m ² and $\phi = 30^0$. Also draw the sketch of wall with design details. Write a brief critical note on 'Taylor's Stability Number'	06 03
Q.9	a) b)	Draw a neat labeled sketch of a slope and enlist causes of failure of slope. Briefly explain the procedure of friction circle method to determine stability of slopes	03 06

		T.E.	(Part - II) (New) (CBCS) Ex	amii	nation Nov/Dec-2	019
			GEOTECHNICAL EN	GINE	ERING – II	
Day a Time	& Date : 10:0	e: Sat 0 AM	urday, 23-11-2019 To 01:00 PM	-	-	Max. Marks: 70
Instr	uctior	าร: 1)	Q. No. 1 is compulsory and shou	uld be	solved in first 30 mir	nutes in answer
		2)	book.	norko		
		2) 3)	Assume additional data if require	ed an	d mention it clearly.	
		,	MCQ/Objective Typ	e Qu	estions	
Dura	tion: 3	0 Mir	nutes			Marks: 14
Q.1	Choo	ose th	ne correct alternatives from the	optic	ons and rewrite the	14
	sente	nces	3. allowable soil pressure for founda	ation i	n cohesive soil is der	perally
	1)	cont	rolled by .		i conesive son is ger	lerally
		a) c)	Settlements both (a) and (b)	b) d)	Bearing capacity neither (a) nor (b)	
	2)	How	much is the drive weight used in	Stan	dard Penetration test	as per
		$S 2^{\prime}$	131: 1981? 53.5 kg	b)	63 5 kg	
		a) C)	73.5 kg	d)	83.5 kg	
	3)	Ín ca	ase of plate load test seating load	to be	applied is	
	,	a)	5 kPa	b)	10 kPa	
		c)	7 kPa	d)	None	
	4)	Curb	is a component in case of)	Pnoumatic caisson	
		а) С)	Open caisson	d)	All	
	5)	Thes	se types of soil deposits are often	found	d near the mouths of	rivers,
	,	alon	g the perimeters of bays and ben	eath s	swamps or lagoons _	•
		a)	Weak/compressible soil	b)	Collapsible soil	
	•	C)		a)	Corrosive soli	
	6)	The	negative skin friction on a pile de	velop	s when	
		b)	The soil surrounding it settles m	ore th	an the pile	
		c)	The ground water table rises		·	
		d)	The soil near the tip is clay			
	7)	The	group efficiency of driven piles in	sand	at a close spacing m	ay be
		a) c)	Below 100%	(a b)	None of the above	
	8)	Un et	ability analysis the term mobilized	d sha	ar strength is referred	to as
	0)	a)	Shear strength	b)	Maximum shear str	ess
		c)	Applied shear stress	d)	None	
	9)	Tayl	or's stability charts are based on t	the to	tal stress using the _	·
		a)	Friction circle method	b)	Method of slices	
		C)	$\varphi u = v$ analysis	a)	NONE	

Seat No.

SLR-FM-34 Set R

- 10) Which of the following geosynthetic material acts as separator .
 - a) Geocells

b) Geomat

C) Geotextiles Geofoam

SLR-FM-34

Set | R

- d)
- RQD is the ratio of 11)
 - Sum of lengths of rock core pieces greater than 15 cm to the total a) length of core run
 - Sum of lengths of rock core pieces greater than 10 cm to the total b) length of core run
 - C) Sum of lengths of rock core pieces to the total length of core run
 - Sum of lengths of unbroken rock core pieces to the total length of d) core run
- 12) One of the purposes of Soil exploration is _
 - To understand the behaviour of the structure a)
 - To estimate the load coming on the soil b)
 - To find the quantity and quality of water C)
 - d) To determine basic properties of soil
- 13) Which one of the following is not the assumption made in Terazaghi's bearing capacity analysis?
 - The strip footing has rough base a)
 - Failure zone do not extend above the horizontal plane through the b) base of the footing
 - Plastic zone is not fully developed C)
 - The elastic zone has straight boundaries d)
- According to IS: 1904 1966, maximum safe bearing capacity for coarse 14) sand, medium sand and fine sand are respectively (in kg/cm^2)
 - a) 4.5, 2.5, 1.5

- b) 33, 16.5, 9
- 16.5, 9.0, 4.5 C)
- None of these d)

Max. Marks: 56

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering

GEOTECHNICAL ENGINEERING - II

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.

- 2) Q.6 is compulsory; answer any two from remaining questions from Section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

Q.2 With a neat sketch explain borelog chart. 04 a) Determine the ultimate bearing capacity of square footing of 1.5 m size, at b) 06 a depth of 1.5 m, in a pure clay with an unconfined strength of 150 kN/m^2 . $\phi = 0^{0}$ and $\gamma = 17$ kN/m³, Take Nc = 5.7, Ng = 1.0, and Ny = 0 Q.3 Enlist the difference between general shear failure and Local shear failure. 03 a) Determine the allowable gross load and net allowable load of square 06 b) footing of 2m side and With a depth of foundation 1.0 m. use Terzaghi's bearing capacity theory and assume local Shear failure, take factor of safety 3.0, the soil at the site has $\gamma = 18 \text{ kN/m}^3$, $c = 15 \text{ kN/m}^2$ And $\phi = 25^{\circ}$, Take Nc = 14.8, Ng = 5.6, and N $\gamma = 3.2$ Q.4 Explain the procedure of Plate load test with neat sketches. 05 a) Calculate the consolidation settlement of a clay layer of 12 m thick with 04 b) initial void ratio of 0.90. The unit weight of clay is 18 kN/m³ and liquid limit of undisturbed soil is 60%. Foundation load will subject the center of layer to a vertical stress increase of 10 kPa. Q.5 Explain uses of geotextiles in road construction with neat sketches. 04 a) What is collapsible soil? What are the precautions of be taken before b) 05 starting of construction in collapsible soil?

Section – II

- Q.6 a) Write short note on Negative skin friction.
 b) Design a strap footing for two columns using following data.
 Load carried by external column is 2800 kN and that by internal column is 4250 kN c/c Spacing between the columns is 6.8 m, size of each column is 450 mm × 450 mm and External column is at a distance of 280 mm from the boundary. Assume allowable soil pressure is 325 kN/m².
 Q.7 a) A reinforced cement concrete pile weighing 30kN (including helmet and dolly) is driven by a drop hammer weighing 30 kN with an effective fall of
 - dolly) is driven by a drop hammer weighing 30 kN with an effective fall of 0.9 m. the average penetration per blow is 15mm. the total temporary elastic compression of the pile, pile cap and soil may be taken as 18 mm. coefficient of restitution 0.36, what is the allowable load on the pile with a factor of safety 2.0, Use Haley's formula.
 - **b)** List out the types of Caissons.

		SLR-FM-3	34
		Set	R
Q.8	a) b)	Design sheet pile wall for a height of 5.0 m in sandy soil and supporting sandy soil having $\gamma = 16 \text{ kN/m}^3$, c = 0kN/m ² and $\phi = 30^0$. Also draw the sketch of wall with design details. Write a brief critical note on 'Taylor's Stability Number'	06 03
Q.9	a) b)	Draw a neat labeled sketch of a slope and enlist causes of failure of slope. Briefly explain the procedure of friction circle method to determine stability of slopes	03 06

Seat No.						Set	S
	T.E	(Part - II) (New) (CBCS) Exar	nir	nation Nov/Dec-2019	•	
		GEOTEC		rin NE			
Day &	Date: Sa	urday, 23-11-2019			Ma:	x. Marks	s: 70
Instru	10:00 AIV		ulsory and should	he	solved in first 30 minute	s in ansv	ver
monu		book.					
	2 3	Figures to the rig	nt indicate full ma al data if required	rks an	a. d mention it clearly.		
	00 14	MCQ	Objective Type	Qu	estions	M	
	on: 30 Mil Choose ti	lutes	tives from the or	otic	one and rowrite the	Marks	5:14 11
s s	sentence	s.		Juc			14
1) The a) b) c) d)	negative skin friction The soil in which The soil surround The ground water The soil near the	on on a pile devel it is driven is sand ing it settles more table rises tip is clay	ops Jy s e th	s when soil an the pile		
2	2) The a) c)	group efficiency of Equal to 100% Below 100%	driven piles in sa b d	nd)	at a close spacing may b Greater than 100% None of the above	be	_·
3	3) In st a) c)	ability analysis, the Shear strength Applied shear stre	e term mobilized s b ess d	shea))	ar strength is referred to Maximum shear stress None	as	•
4	l) Tayl a) c)	or's stability charts Friction circle met $\phi u = 0$ analysis	are based on the thod b) d)	∍ to [.]))	tal stress using the Method of slices None		
5	5) Whi a) c)	ch of the following Geocells Geotextiles	geosynthetic mate b) d)	eria))	al acts as separator Geomat Geofoam		
6	6) RQI a)	is the ratio of Sum of lengths of length of core run	 ⁱ rock core pieces	gr	eater than 15 cm to the to	otal	
	b)	Sum of lengths of length of core run	rock core pieces	gre	eater than 10 cm to the to	otal	
	c) d)	Sum of lengths of Sum of lengths of core run	rock core pieces unbroken rock co	to ore	the total length of core rupieces to the total length	in of	
7	7) One a) b) c) d)	of the purposes of To understand the To estimate the lo To find the quanti To determine bas	Soil exploration i e behaviour of the bad coming on the ty and quality of v ic properties of so	s _ e st e sc vate oil	 ructure oil er		

SLR-FM-34

- 8) Which one of the following is not the assumption made in Terazaghi's bearing capacity analysis?
 - a) The strip footing has rough base
 - b) Failure zone do not extend above the horizontal plane through the base of the footing
 - c) Plastic zone is not fully developed
 - d) The elastic zone has straight boundaries
- 9) According to IS: 1904 1966, maximum safe bearing capacity for coarse sand, medium sand and fine sand are respectively (in kg/cm²)
 - a) 4.5, 2.5, 1.5 b) 33, 16.5, 9
 - c) 16.5, 9.0, 4.5 d) None of these
- 10) The allowable soil pressure for foundation in cohesive soil is generally controlled by _____.
 - a) Settlements b) Bearing capacity
 - c) both (a) and (b) d) neither (a) nor (b)
- 11) How much is the drive weight used in Standard Penetration test as per IS 2131: 1981?
 - a) 53.5 kg b) 63.5 kg
 - c) 73.5 kg d) 83.5 kg
- 12) In case of plate load test seating load to be applied is _____.
 - a) 5 kPa b) 10 kPa
 - c) 7 kPa d) None
- 13) Curb is a component in case of _____
 - a) Box caisson b) Pneumatic caisson
 - c) Open caisson d) All
- 14) These types of soil deposits are often found near the mouths of rivers, along the perimeters of bays and beneath swamps or lagoons _____.
 - a) Weak/compressible soil
- b) Collapsible soil
- c) Expansive soil
- d) Corrosive soil

Set | S

Max. Marks: 56

Seat	
No.	

Set S

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.

- 2) Q.6 is compulsory; answer any two from remaining questions from Section II.
- 3) Figures to the right indicate full marks.
- 4) Assume additional data if required and mention it clearly.

Section – I

 Q.3 a) Enlist the difference between general shear failure and Local shear failure. b) Determine the allowable gross load and net allowable load of square footing of 2m side and With a depth of foundation 1.0 m. use Terzaghi's bearing capacity theory and assume local Shear failure, take factor of safety 3.0, the soil at the site has γ = 18 kN/m³, c = 15 kN/m² And φ = 25⁰, Take Nc = 14.8, Nq = 5.6, and Nγ = 3.2 Q.4 a) Explain the procedure of Plate load test with neat sketches. b) Calculate the consolidation settlement of a clay layer of 12 m thick with initial void ratio of 0.90. The unit weight of clay is 18 kN/m³ and liquid limit of undisturbed soil is 60%. Foundation load will subject the center of layer to a vertical stress increase of 10 kPa. Q.5 a) Explain uses of geotextiles in road construction with neat sketches. b) What is collapsible soil? What are the precautions of be taken before of starting of construction in collapsible capit? 	Q.2	a) b)	With a neat sketch explain borelog chart. Determine the ultimate bearing capacity of square footing of 1.5 m size, at a depth of 1.5 m, in a pure clay with an unconfined strength of 150 kN/m ² . $\phi = 0^0$ and $\gamma = 17$ kN/m ³ , Take Nc = 5.7, Nq = 1.0, and N $\gamma = 0$	04 06
 Q.4 a) Explain the procedure of Plate load test with neat sketches. b) Calculate the consolidation settlement of a clay layer of 12 m thick with initial void ratio of 0.90. The unit weight of clay is 18 kN/m³ and liquid limit of undisturbed soil is 60%. Foundation load will subject the center of layer to a vertical stress increase of 10 kPa. Q.5 a) Explain uses of geotextiles in road construction with neat sketches. b) What is collapsible soil? What are the precautions of be taken before 	Q.3	a) b)	Enlist the difference between general shear failure and Local shear failure. Determine the allowable gross load and net allowable load of square footing of 2m side and With a depth of foundation 1.0 m. use Terzaghi's bearing capacity theory and assume local Shear failure, take factor of safety 3.0, the soil at the site has $\gamma = 18 \text{ kN/m}^3$, $c = 15 \text{ kN/m}^2$ And $\phi = 25^0$, Take Nc = 14.8, Nq = 5.6, and N $\gamma = 3.2$	03 06
 Q.5 a) Explain uses of geotextiles in road construction with neat sketches. b) What is collapsible soil? What are the precautions of be taken before construction in collapsible coil? 	Q.4	a) b)	Explain the procedure of Plate load test with neat sketches. Calculate the consolidation settlement of a clay layer of 12 m thick with initial void ratio of 0.90. The unit weight of clay is 18 kN/m ³ and liquid limit of undisturbed soil is 60%. Foundation load will subject the center of layer to a vertical stress increase of 10 kPa.	05 04
	Q.5	a) b)	Explain uses of geotextiles in road construction with neat sketches. What is collapsible soil? What are the precautions of be taken before starting of construction in collapsible soil?	04 05

Section – II

- 04 Q.6 Write short note on Negative skin friction. a) Design a strap footing for two columns using following data. 06 b) Load carried by external column is 2800 kN and that by internal column is 4250 kN c/c Spacing between the columns is 6.8 m, size of each column is 450 mm \times 450 mm and External column is at a distance of 280 mm from the boundary. Assume allowable soil pressure is 325 kN/m². Q.7 A reinforced cement concrete pile weighing 30kN (including helmet and 06 a) dolly) is driven by a drop hammer weighing 30 kN with an effective fall of
 - 0.9 m. the average penetration per blow is 15mm. the total temporary elastic compression of the pile, pile cap and soil may be taken as 18 mm. coefficient of restitution 0.36, what is the allowable load on the pile with a factor of safety 2.0, Use Haley's formula.
 - b) List out the types of Caissons.
| | | SLR-FM- | 34 |
|-----|----------|---|----------|
| | | Set | S |
| Q.8 | a)
b) | Design sheet pile wall for a height of 5.0 m in sandy soil and supporting sandy soil having $\gamma = 16 \text{ kN/m}^3$, c = 0kN/m ² and $\phi = 30^0$. Also draw the sketch of wall with design details.
Write a brief critical note on 'Taylor's Stability Number' | 06
03 |
| Q.9 | a)
b) | Draw a neat labeled sketch of a slope and enlist causes of failure of slope.
Briefly explain the procedure of friction circle method to determine stability
of slopes | 03
06 |

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering

ENVIRONMENTAL ENGINEERING – II

Day & Date: Monday, 25-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever necessary and mention it clearly.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives form the options and rewrite the sentence. 14

- Quantity of wastewater flowing through sewers in dry season is known as _____. 1)
 - WWF a) c) Storm water flow d) Sullage
- _____ sewer collects sewage directly from houses. 2)

a)	Trunk	b)	Lateral
c)	Sub main	d)	House

Pick out the odd one from the following. 3)

- Sutro weir Parshall flume a) b)
- V notch Proportional flow weir C) d)
- 4) RBC and Trickling filters are examples of _____ process.
 - Suspended growth process Anaerobic process a) b)
 - Attached growth process d) All of above C)

Maximum population that can be served by using septic tank is _____. 5)

- a) 100 b) 200
- c) 250 d) 300

__g/d/m³. 6) Organic loading adopted for low rate trickling filter is

- 80 to 320 800 to 3200 a) b) C)
 - 5000 to 10000 500 to 1000 d)

is ultimate disposal option considered in Municipal Solid (MSW) 7) waste management. Incineration

- Landfill a)
- Composting Open burning C) d)
- 8) Pick out the odd one with respect to digestion process _ Acidoaenesis
 - **Hvdrolvsis** b) a) Methanogenesis d) c)
- Disposal option/s for screenings is/are 9)

a)

C)

Incineration b)

Dilution

b)

Burial Digestion All of above d)

SLR-FM-35

Max. Marks: 70

Marks: 14



- DWF
- b)



10)	Pollutants emitted from identifiable sources are known as	pollutants.
-----	---	-------------

Tertiary a)

b) Secondary

Primary C)

- d) None of these
- Indicator used in BDO test is _____. 11)
 - a) Potassium chromate
 - MO C)

C)

- DO deficit = DO_{sat} _____. 12) a) Initial DO Final DO b) Actual DO or DO of mix c)
 - d) None of these

b) Starch

PP

d)

- 13) type of digestion takes less time for digestion.
 - Thermophilic a)
- b) Mesophilic
- Anaerobic d) All of the above
- 14) Mesosphere and Thermosphere together can be called as _____.
 - Chemosphere a) lonosphere c)

- b) Lithosphere
- d) Radiosphere

Page 3 of 16

SLR-FM-35

Set

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – II**

Day & Date: Monday, 25-11-2019

Time: 10:30 AM To 01:00 PM

Instructions: 1) Q. No. 2 & Q. 7 are compulsory.

- 2) Answer any two questions from each section
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever necessary and mention it clearly.
 - 5) Use of non programmable calculator is allowed.

Section I

- Q.2 a) Draw a flow chart for treatment of domestic wastewater consisting of ASP 05 as secondary biological unit. Also state function of each unit in tabular format.
 - b) A sewer of 1m dia. Carries a certain discharge while running full. What will 05 be the depth of flow and corresponding velocity ratio if discharge in the sewer is reduced to one fourth of the value? Assume N remains constant at all states of flow.

Q.3	a)	Define BOD. Differentiate between BOD and COD	04
	b)	Define SVI and state its unit. Derive relation between SVI and recirculation	05
		(Q _r)	
Q.4	a)	Define -	04

- Define -**Q.4** a)
 - 1) HRT 2)
 - Sludge age Volumetric loading 3)
 - 4) F/M ratio

	,	
b)	Design a completely mixed ASP for following data:	05

- Wastewater flow = 20 MLd 1)
- 2) Influent BOD = 200 mg/Lit
- Effluent BOD = 25 mg/Lit 3)
- 4) MLSS = 2000 mg/Lit
- F/M = 0.25)
- SVI = 80 ml/gm6)

Also design diffused aeration system

Write Short notes. (Any three) Q.5

- a) Stages in Anaerobic digestion
- b) NRC equation
- c) Operational Problems in tricking filter
- d) SBR

Max. Marks: 56



Section-II

Q.6	a)	Give detailed c	lassification of	f sources of ai	r pollutants	04
	b)	Find resultant v	alues of temp	erature, BOD	$_5$ and DO if wastewater is	05
		discharged into	o river.			
		Parameter	wastewater	River		
		Temperature	25 ⁰ C	20 ⁰ C		
		BOD ₅	200 mg/lit	0 mg/lit		
		DO	0 mg/lit	9.17 mg/lit		
		Flow	0.8 m ³ /sec	10 m ³ /sec		
Q.7	a)	Enlist different pollution. Expla	types of partic in spray towe	ulate control e r in detail.	equipment's used to control air	05
	b)	Explain Global Definition, caus	warming with ses, diagram, e	respect to foll effects and re	owing points: medies	05
Q.8	a) b)	Explain stability What is compo Indore method	/ conditions in sting? List out in detail.	detail. different metl	nods of composting and discuss	05 04
Q.9	Wri	rite short notes. (Any three) (
	a) b) c) d)	Chemical characteristics of solid wastes Decentralized treatment				
	u)					

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – II**

Day & Date: Monday, 25-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever necessary and mention it clearly.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives form the options and rewrite the sentence. 14

- Pick out the odd one with respect to digestion process _ 1)
- Hydrolysis Acidogenesis a) b) C) Methanogenesis d) Dilution Disposal option/s for screenings is/are 2)
 - Burial Incineration a) b) Digestion d) All of above C)

Pollutants emitted from identifiable sources are known as _____ pollutants. 3)

- Tertiarv b) Secondary a)
- d) None of these c) Primary
- Indicator used in BDO test is ____ 4)
 - a) Potassium chromate b) Starch C) MO d) PP
- DO deficit = DO_{sat} ____. 5)
 - a) Initial DO b) Final DO C) Actual DO or DO of mix d) None of these
- 6) type of digestion takes less time for digestion.
 - Thermophilic b) Mesophilic a) Anaerobic C)
 - d) All of the above

Mesosphere and Thermosphere together can be called as . 7)

- Chemosphere b) Lithosphere a)
- Ionosphere d) Radiosphere C)
- Quantity of wastewater flowing through sewers in dry season is known as _____. 8)
 - WWF a) b) DWF
 - Storm water flow Sullage C) d)
- 9) _ sewer collects sewage directly from houses.
 - Trunk Lateral a) b) Sub main House
 - d) c)
- Pick out the odd one from the following. 10) Sutro weir a) b)
 - Parshall flume Proportional flow weir V - notch C) d)

SLR-FM-35

Set

Marks: 14

Q

Max. Marks: 70

Seat No.

- 11) RBC and Trickling filters are examples of _____ process.
 - Suspended growth process a)
- b) Anaerobic process

Set Q

- c) Attached growth process
- d) All of above
- Maximum population that can be served by using septic tank is _____. 12)
 - a) 100 b) 200
 - 250 d) 300 c)

Organic loading adopted for low rate trickling filter is _____ g/d/m³. 13)

- 800 to 3200 80 to 320 b)
- 500 to 1000 d) 5000 to 10000 c)
- _ is ultimate disposal option considered in Municipal Solid (MSW) 14) waste management.
 - Landfill a)

a)

b) Incineration

c) Composting

Open burning d)

Max. Marks: 56

Time: 10:30 AM To 01:00 PM Instructions: 1) Q. No. 2 & Q. 7 are compulsory. 2) Answer any two questions from each section

- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary and mention it clearly.
- 5) Use of non programmable calculator is allowed.

Section I

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – II**

- Q.2 a) Draw a flow chart for treatment of domestic wastewater consisting of ASP 05 as secondary biological unit. Also state function of each unit in tabular format. b) A sewer of 1m dia. Carries a certain discharge while running full. What will
 - 05 be the depth of flow and corresponding velocity ratio if discharge in the sewer is reduced to one fourth of the value? Assume N remains constant at all states of flow.

Define BOD. Differentiate between BOD and COD Q.3 **a**)

- b) Define SVI and state its unit. Derive relation between SVI and recirculation 05 (Q_r)
- Q.4 a) Define -1) HRT
 - 2) Sludge age

Day & Date: Monday, 25-11-2019

- 3) Volumetric loading
- 4) F/M ratio

b) Design a completely mixed ASP for following data:

- Wastewater flow = 20 MLd 1)
- 2) Influent BOD = 200 mg/Lit
- Effluent BOD = 25 mg/Lit 3)
- MLSS = 2000 mg/Lit 4)
- 5) F/M = 0.2
- SVI = 80 ml/gm6)

Also design diffused aeration system

Write Short notes. (Any three) Q.5

- a) Stages in Anaerobic digestion
- **b)** NRC equation
- c) Operational Problems in tricking filter
- d) SBR



Seat No.



04

04

05



Section-II

Q.6	a) b)	Give detailed c Find resultant v discharged into	lassification of alues of temp river.	sources of ai erature, BOD	r pollutants ₅ and DO if wastewater is	04 05
		Parameter	wastewater	River		
		Temperature	25 ⁰ C	20 ⁰ C		
		BOD ₅	200 mg/lit	0 mg/lit		
		DO	0 mg/lit	9.17 mg/lit		
		Flow	0.8 m ³ /sec	10 m ³ /sec		
Q.7 a) Enlist different types of particulate control equipment's used to co pollution. Explain spray tower in detail.				equipment's used to control air	05	
	b)	Explain Global Definition, caus	warming with ses, diagram, e	respect to foll effects and re	owing points: medies	05
Q.8	a) b)	Explain stability What is compo Indore method	<pre>/ conditions in sting? List out in detail.</pre>	detail. different metl	nods of composting and discuss	05 04
Q.9	Wri a) b) c) d)	ite short notes. (Any three)(Zones of purification in self-purification of stream process(Chemical characteristics of solid wastes(Decentralized treatment(ESP(09

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

ENVIRONMENTAL ENGINEERING – II

Day & Date: Monday, 25-11-2019

Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever necessary and mention it clearly.
- 4) Use of non-programmable calculator is allowed.

Duration: 30 Minutes

Q.1 Choose the correct alternatives form the options and rewrite the sentence. 14

MCQ/Objective Type Questions

- 1) Maximum population that can be served by using septic tank is _____.
 - a) 100 b) 200 c) 250 d) 300
- 2) Organic loading adopted for low rate trickling filter is $_____g/d/m^3$.
 - a) 80 to 320 b) 800 to 3200
 - c) 500 to 1000 d) 5000 to 10000
- 3) _____ is ultimate disposal option considered in Municipal Solid (MSW) waste management.

b)

Incineration

- a) Landfill
 - c) Composting d) Open burning

4) Pick out the odd one with respect to digestion process _____

a) Hydrolysisb) Acidogenesisc) Methanogenesisd) Dilution

5) Disposal option/s for screenings is/are _____.a) Burialb) Incineration

c) Digestion d) All of above

6) Pollutants emitted from identifiable sources are known as _____ pollutants.

- a) Tertiary b) Secondary
- c) Primary d) None of these
- 7) Indicator used in BDO test is _____.
 - a) Potassium chromate b) Starch c) MO d) PP
- 8) DO deficit = DO_{sat} -____.
 - a) Initial DO
 b) Final DO
 c) Actual DO or DO of mix
 d) None of these
- 9) _____ type of digestion takes less time for digestion.
 - a) Thermophilic b) Mesophilic
 - c) Anaerobic d) All of the above

SLR-FM-35

Set R

Max. Marks: 70

Marks: 14

				SLR-FM-35
				Set R
10)	Mes a) c)	osphere and Thermosphere toge Chemosphere Ionosphere	ther b) d)	can be called as Lithosphere Radiosphere
11)	Qua a) c)	ntity of wastewater flowing throug WWF Storm water flow	h se b) d)	wers in dry season is known as DWF Sullage
12)	a) c)	sewer collects sewage directly Trunk Sub main	fron b) d)	n houses. Lateral House
13)	Pick a) c)	out the odd one from the followir Sutro weir Proportional flow weir	b) d)	Parshall flume V - notch

- 14) RBC and Trickling filters are examples of _____ process.
 a) Suspended growth process b) Anaerobic process
 c) Attached growth process d) All of above

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL ENGINEERING – II

Day & Date: Monday, 25-11-2019

Time: 10:30 AM To 01:00 PM

Max. Marks: 56

SLR-FM-35

Set

Instructions: 1) Q. No. 2 & Q. 7 are compulsory.

- 2) Answer any two questions from each section
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever necessary and mention it clearly.
 - 5) Use of non programmable calculator is allowed.

Section I

- Q.2 a) Draw a flow chart for treatment of domestic wastewater consisting of ASP 05 as secondary biological unit. Also state function of each unit in tabular format.
 - b) A sewer of 1m dia. Carries a certain discharge while running full. What will 05 be the depth of flow and corresponding velocity ratio if discharge in the sewer is reduced to one fourth of the value? Assume N remains constant at all states of flow.

Q.3	a)	Define BOD. Differentiate between BOD and COD	04
	b)	Define SVI and state its unit. Derive relation between SVI and recirculation	05
		(Q _r)	
Q.4	a)	Define -	04
		1) HRT	

- 2) Sludge age
- 3) Volumetric loading
- 4) F/M ratio

b)	Des	sign a	com	plet	tely	mixed ASP for following data:	05
	4.				~ .		

- 1) Wastewater flow = 20 MLd
- 2) Influent BOD = 200 mg/Lit
- 3) Effluent BOD = 25 mg/Lit
- 4) MLSS = 2000 mg/Lit
- 5) F/M = 0.2
- 6) SVI = 80 ml/gm

Also design diffused aeration system

Q.5 Write Short notes. (Any three)

- a) Stages in Anaerobic digestion
- b) NRC equation
- c) Operational Problems in tricking filter
- d) SBR



Section-II

Q.6	a) b)	Give detailed classification of sources of air pollutants Find resultant values of temperature, BOD ₅ and DO if wastewater is				
		discharged into	o river.			
		Parameter	wastewater	River		
		Temperature	25 ⁰ C	20 ⁰ C		
		BOD ₅	200 mg/lit	0 mg/lit		
		DO	0 mg/lit	9.17 mg/lit		
		Flow	0.8 m ³ /sec	10 m ³ /sec		
Q.7	a)	Enlist different pollution. Expla	types of partic in spray towe	ulate control e r in detail.	equipment's used to control air	05
	b)	Explain Global Definition, caus	warming with ses, diagram, e	respect to foll effects and re	owing points: medies	05
Q.8	a) b)	Explain stability What is compo Indore method	/ conditions in sting? List out in detail.	detail. different metl	nods of composting and discuss	05 04
Q.9	Wri a) b)	 /rite short notes. (Any three)) Zones of purification in self-purification of stream process) Chemical characteristics of solid wastes 				
	c) d)	Decentralized t	reatment			

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ENVIRONMENTAL ENGINEERING – II

Day & Date: Monday, 25-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever necessary and mention it clearly.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration:	30	Minutes
-----------	----	---------

Seat

No.

Choose the correct alternatives form the options and rewrite the sentence. 14 Q.1

- Pollutants emitted from identifiable sources are known as _____ pollutants. 1)
- a) Tertiary b) Secondary Primary d) None of these C) Indicator used in BDO test is _____. 2)
 - Potassium chromate b) Starch a) MO d) PP C)
- 3) DO deficit = DO_{sat} - ____
- a) Initial DO b) Final DO Actual DO or DO of mix c) d) None of these
- 4) type of digestion takes less time for digestion.
 - Thermophilic b) Mesophilic a)
 - Anaerobic d) All of the above c)
- Mesosphere and Thermosphere together can be called as _____. 5)
 - Chemosphere a) Ionosphere C)
- b) Lithosphere d) Radiosphere

6) Quantity of wastewater flowing through sewers in dry season is known as _____.

- WWF b) DWF a)
- Storm water flow C) d) Sullage

sewer collects sewage directly from houses. 7)

- Trunk Lateral a) b) Sub main House C) d)
- 8) Pick out the odd one from the following.
 - a) Sutro weir b) Parshall flume
 - Proportional flow weir C) d) V - notch
- 9) RBC and Trickling filters are examples of _____ ___ process.
 - Suspended growth process Anaerobic process a) b)
 - Attached growth process All of above c) d)

Maximum population that can be served by using septic tank is . 10)

- 100 200 a) b)
- 250 300 C) d)

SLR-FM-35



Max. Marks: 70

Marks: 14

____ g/d/m³. 11) Organic loading adopted for low rate trickling filter is

80 to 320 a)

800 to 3200 b)

SLR-FM-35

Set S

c) 500 to 1000

- d) 5000 to 10000
- is ultimate disposal option considered in Municipal Solid (MSW) 12) waste management. Landfill a)
 - b) Incineration
 - Composting Open burning d)
- Pick out the odd one with respect to digestion process _____. 13)
 - Acidogenesis Hydrolysis b)
 - Methanogenesis d) Dilution c)
- Disposal option/s for screenings is/are 14)
 - Burial a)

c)

a)

- Incineration b)
- c) Digestion

d) All of above

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – II**

Day & Date: Monday, 25-11-2019

Time: 10:30 AM To 01:00 PM

Seat

No.

Max. Marks: 56

Instructions: 1) Q. No. 2 & Q. 7 are compulsory.

- 2) Answer any two questions from each section
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever necessary and mention it clearly.
 - 5) Use of non programmable calculator is allowed.

Section I

- Q.2 a) Draw a flow chart for treatment of domestic wastewater consisting of ASP 05 as secondary biological unit. Also state function of each unit in tabular format.
 - b) A sewer of 1m dia. Carries a certain discharge while running full. What will 05 be the depth of flow and corresponding velocity ratio if discharge in the sewer is reduced to one fourth of the value? Assume N remains constant at all states of flow.

Q.3	a) b)	Define BOD. Differentiate between BOD and COD Define SVI and state its unit. Derive relation between SVI and recirculation (Q_r)	04 05
Q.4	a)	Define - 1) HRT 2) Sludge age 3) Volumetric loading	04
	b)	Design a completely mixed ASP for following data:	05

- Wastewater flow = 20 MLd 1)
- 2) Influent BOD = 200 mg/Lit
- 3) Effluent BOD = 25 mg/Lit
- 4) MLSS = 2000 mg/Lit
- 5) F/M = 0.2
- SVI = 80 ml/gm6)

Also design diffused aeration system

Write Short notes. (Any three) Q.5

- a) Stages in Anaerobic digestion
- **b)** NRC equation
- c) Operational Problems in tricking filter
- d) SBR



SLR-FM-35



Section-II

04 05
05
05
05 s 04
09

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ENGINEERING MANAGEMENT – I Day & Date: Tuesday, 26-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- 3) Figure to the right indicates full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Row wise and column wise difference between two minimum cost in VAM 1) method is
 - a) Capital cost
 - Fixed cost b)
 - Variable cost c)
 - d) None

2) Major elements of queuing system are

- Customer a)
- Service Channel c)

b)

d)

- 3) MBO is developed by _____.
 - Gilberth a)
 - Fayol c)
- 4) ABC analysis considers _____.
 - Total consumption of items a)
 - b) Total amount of items
 - c) Both a) and b)
 - None of these d)

Pure strategy games are those in which both players . 5)

- Play more than one strategy a)
- Stay with one strategy throughout b)
- C) Employ fresh strategies every time the act is played
- Plav 3 strategies d)
- Saddle point is the point of intersection of two _____. 6)
 - Mixed strategies a) b)
 - Both a) and b) c)
- 7) Dual is obtained for
 - Simplex problem a)
 - Transportation problem b)
 - Both a) and b) c)
 - None of these d)

- Pure strategies
- d) None of these

SLR-FM-36

Set



Marks: 14

Max. Marks: 70

b)

Queue

- All the above

Taylor

Peter Drucker

d)

				Set
8)	Milita a) c)	ary organization is: Fine and staff Line	b) d)	Matrix Functional
9)	EOC a) c)	e means Economic Offering Quantity Economic Order Quantity	b) d)	Empty Order Quantity Economic Order Quality
10)	Leac a) c)	time involves: Raising of purchase requisition Placement of an order	b) d)	Transportation All of the above
11)	In de a) c)	ecision tree problem, the node mo Square Triangle	de is b) d)	shown by Circle Rectangle
12)	Dyna a) c)	amic programming is discovered I Taylor Richard Bellmen	by b) d)	Henny Fayol Monte - Carlo
13)	Grap	phical method to solve linear prog	ramm	ing problem is commonly used
	a) c)	No. of decision variable is two No. of decision variable is four	b) d)	No.of decision variable is three No. of decision variable is one
14)	Whe a)	n total supply total demand, the to Simple	ransp b)	ortation problem is called? Balanced

- c) Equated
- d) Balanc

Ρ

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – I

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever required.
- 4) Use of non-programmable calculator is allowed.

Section I

Q.2 Answer any three.

- a) Write down contribution of Gilberth & Taylor towards development of management.
- **b)** A person requires 10, 12 & 12 units of chemicals P, Q & R resp. for his garden.

Liquid product contain 5, 2 & 1 units of P, Q & R resp. per jar. Dry product contains 1, 2 & 4 units of P, Q & R resp. per cartoon.

If the liquid product sells for Rs.3 per jar & the day product sells for Rs.2 per cartoon, how many of each should be purchased to minimize the cost & meet the requirement?

Ш

28

20

20

16

IV

21

15

15

12

Formulate the LLP & solve it graphically.

c) Solves the following assignment model to find maximum expected sale.

35

25

25

20

42

30

30

24

- 1) Decision
- 2) Assignment model
- e) Two proposals for flood control namely X & Y are under consideration. The capital investment in x & y is Rs.28 lakhs & Rs.14 lakhs resp. There are three states of nature high flood (S1), medium flood (S2) and low flood (S3) with probabilities 0.5, 0.3 & 0.2 resp.

The damage saving estimates under S1, S2 & S3 are Rs.100 lakhs, Rs.60 lakhs & Rs.20 lakhs due to plant x, whereas Rs.24 lakhs, Rs.44 lakhs & Rs.20 lakhs resp. due to plant y. The saving is estimated in per annum. The effective life of both system is 10 yrs.

Draw the decision tree, find expected monetary value for each proposals & indicate which is more beneficial proposal?

Solves the following assignment mod

Salesmen

А

В

С

D

Seat No.

Set P

SLR-FM-36

Max. Marks: 56

Section – II

Q.3 Answer any one.

- a) Note on communication process
- **b)** Note on Queuing theory

Q.4 Answer any four.

a) Explain importance of material.

What is Break Even Analysis? Explain with example how it is important for b) material management.

- Taking any example tell how average chart & range charts are used in c) SQC?
- d) Classify the following items into ABC categories using graphi

	-	
Item	Unit Price in Rs.	Annual consumption unit
A11	1200	25
A12	900	35
A13	1400	15
A14	400	55
A15	300	35
A16	700	10
A17	400	25
A18	5000	10
A19	250	15
A20	220	25
A21	225	25
A22	225	25
1		1

- Write note on Profit & Loss account and Balance sheet. e)
- Write a note various types inventory cost. **f**)
- ABC corporation has got a demand for particular part at 10000 units per g) year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine.
 - 1) EOQ
 - 2) Optimum numbers of orders to be placed per annum
 - 3) Total cost of inventory per annum

04

28

SLR-FM-36

Set

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT – I** Day & Date: Tuesday, 26-11-2019 Max. Marks: 70 Time: 10:00 AM To 01:00 PM **Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Assume suitable data whenever required. Figure to the right indicates full marks. 4) Use of non-programmable calculator is allowed. **MCQ/Objective Type Questions** Marks: 14

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- Military organization is: _____. 1)
 - Fine and staff a)
 - c) Line
- EOQ means ____ 2)

a)

c)

Economic Offering Quantity b) Empty Order Quantity

Functional

Matrix

Economic Order Quantity Economic Order Quality d)

b)

d)

3) Lead time involves:

- Raising of purchase requisition Transportation a) b) c)
 - Placement of an order All of the above d)
- In decision tree problem, the node mode is shown by _____ 4)
 - Square Circle a) b)
 - c) Triangle d) Rectangle
- Dynamic programming is discovered by 5)
 - Henny Fayol Tavlor a) b)
 - **Richard Bellmen** Monte - Carlo c) d)
- 6) Graphical method to solve linear programming problem is commonly used if
 - No. of decision variable is two No.of decision variable is three a) b)
 - No. of decision variable is four No. of decision variable is one c) d)
- 7) When total supply total demand, the transportation problem is called?
 - Simple Balanced a) b)
 - Equated d) Zero c)
- Row wise and column wise difference between two minimum cost in VAM 8) method is
 - a) Capital cost
 - b) Fixed cost
 - c) Variable cost
 - None d)

Major elements of queuing system are 9) b)

Customer a) c)

- Queue
- Service Channel d) All the above

SLR-FM-36



MBO is developed by _____. 10)

- Gilberth a)
- C) Fayol

Peter Drucker b)

SLR-FM-36

Set Q

- d) Taylor
- ABC analysis considers _____. 11)
 - Total consumption of items a)
 - b) Total amount of items
 - C) Both a) and b)
 - None of these d)
- Pure strategy games are those in which both players _____. 12)
 - Play more than one strategy a)
 - Stay with one strategy throughout b)
 - Employ fresh strategies every time the act is played c)
 - Play 3 strategies d)
- Saddle point is the point of intersection of two ____ 13)
 - Mixed strategies a) c)
 - Both a) and b)
- Dual is obtained for _____. 14)
 - Simplex problem a)
 - b) Transportation problem
 - Both a) and b) C)
 - None of these d)

- Pure strategies b)
- d) None of these

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Tuesday, 26-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All guestions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever required.
- 4) Use of non-programmable calculator is allowed.

Section I

Q.2 Answer any three.

- Write down contribution of Gilberth & Taylor towards development of a) management.
- A person requires 10, 12 & 12 units of chemicals P, Q & R resp. for his b) garden.

Liquid product contain 5, 2 & 1 units of P, Q & R resp. per jar. Dry product contains 1, 2 & 4 units of P, Q & R resp. per cartoon.

If the liquid product sells for Rs.3 per jar & the day product sells for Rs.2 per cartoon, how many of each should be purchased to minimize the cost & meet the requirement?

Formulate the LLP & solve it graphically.

Area

Salesmen

А

В

С

D

Solves the following assignment model to find maximum expected sale. C)

Ш

35

25

25

20

Ш

28

20

20

16

IV

21

15

15

12

L

42

30

30

24

d) Write note on:

- Decision 1)
- 2) Assignment model
- e) Two proposals for flood control namely X & Y are under consideration. The capital investment in x & y is Rs.28 lakhs & Rs.14 lakhs resp. There are three states of nature high flood (S1), medium flood (S2) and low flood (S3) with probabilities 0.5, 0.3 & 0.2 resp.

The damage saving estimates under S1, S2 & S3 are Rs.100 lakhs, Rs.60 lakhs & Rs.20 lakhs due to plant x, whereas Rs.24 lakhs, Rs.44 lakhs & Rs.20 lakhs resp. due to plant y. The saving is estimated in per annum. The effective life of both system is 10 yrs.

Draw the decision tree, find expected monetary value for each proposals & indicate which is more beneficial proposal?

ENGINEERING MANAGEMENT – I

Max. Marks: 56

Set

SLR-FM-36

Seat No.

Section – II

Q.3 Answer any one.

- a) Note on communication process
- **b)** Note on Queuing theory

Q.4 Answer any four.

- a) Explain importance of material.
- **b)** What is Break Even Analysis? Explain with example how it is important for material management.
- c) Taking any example tell how average chart & range charts are used in SQC?
- d) Classify the following items into ABC categories using graphi

Item	Unit Price in Rs.	Annual consumption unit
A11	1200	25
A12	900	35
A13	1400	15
A14	400	55
A15	300	35
A16	700	10
A17	400	25
A18	5000	10
A19	250	15
A20	220	25
A21	225	25
A22	225	25
A16 A17 A18 A19 A20 A21 A22	700 400 5000 250 220 225 225 225	10 25 10 15 25 25 25 25

- e) Write note on Profit & Loss account and Balance sheet.
- f) Write a note various types inventory cost.
- **g)** ABC corporation has got a demand for particular part at 10000 units per year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine.
 - 1) EOQ
 - 2) Optimum numbers of orders to be placed per annum
 - 3) Total cost of inventory per annum

04

28

SLR-FM-36

Set Q

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering

ENGINEERING MANAGEMENT – I

Day & Date: Tuesday, 26-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- 3) Figure to the right indicates full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Pure strategy games are those in which both players _____. 1)
 - Play more than one strategy a)
 - b) Stay with one strategy throughout
 - Employ fresh strategies every time the act is played c)
 - Play 3 strategies d)

2)	Sac	intersection of	tion of two		
,	a)	Mixed stra	ategies	b)	Ρı
			1	Ň	

- Both a) and b) C)
- 3) Dual is obtained for ____
 - Simplex problem a)
 - b) Transportation problem
 - Both a) and b) c)
 - None of these d)
- 4) Military organization is: .
 - Fine and staff a)
 - Line C)

5)

- EOQ means _____.
 - Economic Offering Quantity a)
 - Economic Order Quantity C)
- Lead time involves: _____. 6)
 - Raising of purchase requisition b) a)
 - Placement of an order d) c)
- In decision tree problem, the node mode is shown by . 7)
 - Square Circle b) a) c)
 - Triangle d) Rectangle

Dynamic programming is discovered by ____ 8)

- Henny Fayol Taylor b) a)
- Richard Bellmen Monte - Carlo c) d)
- Graphical method to solve linear programming problem is commonly used 9) if No.of decision variable is three
 - No. of decision variable is two a) b) No. of decision variable is four c)
 - No. of decision variable is one d)



Max. Marks: 70

SLR-FM-36

- ure strategies
- None of these d)
- b) Matrix
 - d) Functional

 - **Empty Order Quantity** b)
 - d) **Economic Order Quality**
 - Transportation

 - All of the above



10) When total supply total demand, the transportation problem is called?

Simple a) Equated

C)

13)

b) Balanced d) Zero

SLR-FM-36

Set | R

- Row wise and column wise difference between two minimum cost in VAM 11) method is _____.
 - a) Capital cost
 - b) Fixed cost
 - Variable cost C)
 - d) None
- 12) Major elements of queuing system are _____
 - Customer Queue a) b) d) All the above
 - Service Channel c)
 - MBO is developed by _____.
 - Gilberth a)
 - C) Fayol

- b) Peter Drucker
- Taylor d)
- ABC analysis considers _____. 14)
 - Total consumption of items a)
 - Total amount of items b)
 - C) Both a) and b)
 - None of these d)

Seat No.

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – I

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever required.
- 4) Use of non-programmable calculator is allowed.

Section I

Q.2 Answer any three.

- a) Write down contribution of Gilberth & Taylor towards development of management.
- **b)** A person requires 10, 12 & 12 units of chemicals P, Q & R resp. for his garden.

Liquid product contain 5, 2 & 1 units of P, Q & R resp. per jar. Dry product contains 1, 2 & 4 units of P, Q & R resp. per cartoon.

If the liquid product sells for Rs.3 per jar & the day product sells for Rs.2 per cartoon, how many of each should be purchased to minimize the cost & meet the requirement?

Formulate the LLP & solve it graphically.

c) Solves the following assignment model to find maximum expected sale.

- 1) Decision
- 2) Assignment model
- e) Two proposals for flood control namely X & Y are under consideration. The capital investment in x & y is Rs.28 lakhs & Rs.14 lakhs resp. There are three states of nature high flood (S1), medium flood (S2) and low flood (S3) with probabilities 0.5, 0.3 & 0.2 resp.

The damage saving estimates under S1, S2 & S3 are Rs.100 lakhs, Rs.60 lakhs & Rs.20 lakhs due to plant x, whereas Rs.24 lakhs, Rs.44 lakhs & Rs.20 lakhs resp. due to plant y. The saving is estimated in per annum. The effective life of both system is 10 yrs.

Draw the decision tree, find expected monetary value for each proposals & indicate which is more beneficial proposal?

L Ш Ш IV Area Salesmen А 42 35 28 21 15 В 30 25 20 15 С 30 25 20 D 24 20 16 12 Max. Marks: 56

24

Set R

SLR-FM-36

Section – II

Q.3 Answer any one.

- a) Note on communication process
- **b)** Note on Queuing theory

Q.4 Answer any four.

- a) Explain importance of material.
- What is Break Even Analysis? Explain with example how it is important for b) material management.

Annual consumption

- Taking any example tell how average chart & range charts are used in C) SQC?
- Classify the following items into ABC categories using graphi d)

Unit Price in

Item	Unit Price in Rs.	unit
A11	1200	25
A12	900	35
A13	1400	15
A14	400	55
A15	300	35
A16	700	10
A17	400	25
A18	5000	10
A19	250	15
A20	220	25
A21	225	25
A22	225	25

- Write note on Profit & Loss account and Balance sheet. e)
- Write a note various types inventory cost. **f**)
- ABC corporation has got a demand for particular part at 10000 units per g) year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine.
 - 1) EOQ
 - 2) Optimum numbers of orders to be placed per annum
 - Total cost of inventory per annum 3)

04

28

SLR-FM-36

Set

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT – I** Day & Date: Tuesday, 26-11-2019 Max. Marks: 70 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- Figure to the right indicates full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Lead time involves: 1)
 - Raising of purchase requisition b) Transportation a) c)
 - Placement of an order All of the above d)
- 2) In decision tree problem, the node mode is shown by _____.
 - Square Circle a) b)
 - Triangle d) Rectangle c)

3) Dynamic programming is discovered by

- Henny Fayol Taylor a) b)
- **Richard Bellmen** Monte - Carlo c) d)
- Graphical method to solve linear programming problem is commonly used 4) if a)
 - No. of decision variable is two b) No.of decision variable is three
 - No. of decision variable is four No. of decision variable is one c) d)
- When total supply total demand, the transportation problem is called? 5)
 - **Balanced** Simple a) b)
 - Equated Zero c) d)
- Row wise and column wise difference between two minimum cost in VAM 6) method is .
 - Capital cost a)
 - b) Fixed cost
 - Variable cost c)
 - d) None
- 7) Major elements of queuing system are _
 - a) Customer b) Queue Service Channel c) d) All the above
- MBO is developed by _____. 8)
 - Gilberth a)
 - C) Fayol

- Peter Drucker b)
- d) Taylor

SLR-FM-36

Set

Marks: 14

Page 14 of 16

- 9) ABC analysis considers _____.
 - a) Total consumption of items
 - b) Total amount of items
 - c) Both a) and b)
 - d) None of these
- 10) Pure strategy games are those in which both players _____.
 - a) Play more than one strategy
 - b) Stay with one strategy throughout
 - c) Employ fresh strategies every time the act is played
 - d) Play 3 strategies
- 11) Saddle point is the point of intersection of two _____
 - b) Pure strategies

SLR-FM-36

Set S

- d) None of these
- 12) Dual is obtained for _____.

a)

C)

- a) Simplex problem
- b) Transportation problem

Mixed strategies

Both a) and b)

- c) Both a) and b)
- d) None of these
- 13) Military organization is: _____.
 - a) Fine and staff
 - c) Line
- 14) EOQ means _____.
 - a) Economic Offering Quantity
 - c) Economic Order Quantity
- b) Matrix
- d) Functional
- b) Empty Order Quantity
- d) Economic Order Quality

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – I

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever required.
- 4) Use of non-programmable calculator is allowed.

Section I

Q.2 Answer any three.

- a) Write down contribution of Gilberth & Taylor towards development of management.
- **b)** A person requires 10, 12 & 12 units of chemicals P, Q & R resp. for his garden.

Liquid product contain 5, 2 & 1 units of P, Q & R resp. per jar. Dry product contains 1, 2 & 4 units of P, Q & R resp. per cartoon.

If the liquid product sells for Rs.3 per jar & the day product sells for Rs.2 per cartoon, how many of each should be purchased to minimize the cost & meet the requirement?

Formulate the LLP & solve it graphically.

Area

Salesmen

А

В

С

D

c) Solves the following assignment model to find maximum expected sale.

Ш

35

25

25

20

Ш

28

20

20

16

IV

21

15

15

12

L

42

30

30

24

- 1) Decision
- 2) Assignment model
- e) Two proposals for flood control namely X & Y are under consideration. The capital investment in x & y is Rs.28 lakhs & Rs.14 lakhs resp. There are three states of nature high flood (S1), medium flood (S2) and low flood (S3) with probabilities 0.5, 0.3 & 0.2 resp.

The damage saving estimates under S1, S2 & S3 are Rs.100 lakhs, Rs.60 lakhs & Rs.20 lakhs due to plant x, whereas Rs.24 lakhs, Rs.44 lakhs & Rs.20 lakhs resp. due to plant y. The saving is estimated in per annum. The effective life of both system is 10 yrs.

Draw the decision tree, find expected monetary value for each proposals & indicate which is more beneficial proposal?

Set

Max. Marks: 56



24

Seat No.

Section – II

Q.3 Answer any one.

- a) Note on communication process
- **b)** Note on Queuing theory

Q.4 Answer any four.

- a) Explain importance of material.
- What is Break Even Analysis? Explain with example how it is important for b) material management.

Annual consumption

- Taking any example tell how average chart & range charts are used in C) SQC?
- Classify the following items into ABC categories using graphi d)

Unit Price in

Item	Unit Price in Rs.	Annual consumption unit
A11	1200	25
A12	900	35
A13	1400	15
A14	400	55
A15	300	35
A16	700	10
A17	400	25
A18	5000	10
A19	250	15
A20	220	25
A21	225	25
A22	225	25

- Write note on Profit & Loss account and Balance sheet. e)
- Write a note various types inventory cost. **f**)
- ABC corporation has got a demand for particular part at 10000 units per g) year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine.
 - 1) EOQ
 - 2) Optimum numbers of orders to be placed per annum
 - Total cost of inventory per annum 3)

04

28

SLR-FM-36

Set

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Use of IS Codes & Steel Table are allowed.
- 4) Use of scientific non-programmable calculator is allowed.
- 5) Assume additional data if required and mention it clearly.
- 6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1

- Choose the correct alternatives from the options and rewrite the sentence. In elastic analysis Condition/s occurs. 1) Mechanism condition Equilibrium condition a) b) c) Plastic moment condition d) None of the above The provision for expansion and contraction should be made such as to 2) permit movements of free bearings to the extent not less than for every 30m length equal to _____. a) 20mm b) 25mm 30mm d) 40mm C) 3) The bearings no pin shall be of diameter less than . a) 8 cm b) 10 cm c) 12 cm d) 15 cm 4) The fully plastic moment Mp of rectangular section of breadth b and depth d is given by a) Mp = $fvbd^2/6$ b) $Mp = fvbd^2/4$ c) Mp = $fybd^2/12$ $Mp = fvbd^2/8$ d) Which approximate method of analysis of building frames for lateral loads 5) is/are more accurate? a) portal method cantilever method b) c) factor method d) all of these In static theorem or lower bound theorem the relation between the value 6) of W and collapse load Wc is a) $W \leq Wc$ b) W = Wc
 - c) $W \ge Wc$ None of these d)

7) The effective width b for a light gauge steel plate is given by _____.

- a) $b=0.9 (E/Fy)^{1/2}$ 1.9 (E/Fy)^{1/2} b)
- c) 2.9 (E/Fy)^{1/2} 3.9 (E/Fy)^{1/2} d)

Set

Max. Marks: 70

Marks: 14

				Set	Ρ
8)	The a) c)	e critical stress of the plate in light $f_{ck} = \pi^2 E / [12(1 - \mu^2)(w/t)^2]$ $f_{ck} = \pi^2 E / [12(1 - \mu^2)(w/t)]$	t gaug b) d)	ge section is given by $f_{ck} = \pi^2 E/[12(1-\mu)(w/t)^2]$ $f_{ck} = \pi^2 E/[12(1-\mu)(w/t)]$	
9)	The bea a) c)	bending stress compression in v m section of light gauge steel sho Fw \leq 300000/(h/t) ² Fw \leq 3586000/(h/t) ²	veb F ould r b) d)	w due to bending moments in a not exceed Fw ≤ $320000/(h/t)^2$ Fw ≥ $300000/(h/t)^2$	
10)	For incr load a) c)	design of railway bridges, the pe rease by when wind loadin d, live load, longitudinal, racking a 16.67% 25%	rmiss g is c and in b) d)	ible primary stresses are onsidered in addition to dead npact forces. 33.33% 40%	
11)	The a) c)	e shape factor for thin tubular sec 1.27 1.5	tion is b) d)	5 1.15 1.7	
12)	The a) b) c) d)	e permissible stress in axial comp only on effective length of the co only on the yield stress of memb only on least radius of gyration all of these	ressio lumn ber	on is dependent upon	
13)	Cla a) c)	ssify the ISLB <u>300@37.7kg/m.</u> plastic semi compact	b) d)	compact slender	
14)	Slid a)	ling plate bearing are suitable for spans less than 10 m	b)	 spans more than 10 m to 50 m	

- c) spans more than 50 m

suspension bridges d)

		-	
Page	3	of	12

09

09

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Instructions: 1) From Section - I Q. No.2 is compulsory and attempts any two questions from remaining questions.

- 2) From Section II Q. No.7 is compulsory and attempts any two questions from remaining questions.
- 3) Figures to the right indicate full marks.
- 4) Use of IS Codes & Steel Table are allowed.
- 5) Use of scientific non-programmable calculator is allowed.
- 6) Assume additional data if required and mention it clearly.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Design the central bottom cord of the N type truss provided for the foot bridge of effective span 20m having clear width of 2.5m. The flooring consists of timber planks of 6cms. Assume self weight of timber plank as 8000N/m³. Live load of 4000N/m². Provide 10 panels of 2m each, keeping the height of main truss as 1.8m for N type truss.
- Q.3 Explain cantilever method for analyzing a building frame subjected to horizontal 09 forces. Also write the assumptions made in the analysis.
- Q.4 Design a light gauge steel section of a column of 4m long to carry a load of 200KN.

Q.5 Attempt the following.

- a) Explain the advantages and disadvantages of using cold framed light gauge steel members.
- b) Write a short note on roller bearing with neat sketch.
- c) Compare the merits of factor method with cantilever method of analysis of lateral loads.

Section – II

- Q.6 Design the continues beam ABCD for a load of 1000N/m throughout the span ABCD. Take load factor of 1.85.
- **Q.7** A portal frame ABCD fixed at A and D, subjected to a loading of 40KN at midpoint of beam BC and 20KN at B acting towards right. The plastic moment capacities for the beams and columns being M_1 and M_2 respectively. Compute the values of M_1 and M_2 for the frame to have minimum weight. Take AB = CD = 3.0 m and BC = 9m.
- **Q.8** A column 4.2m in height and effectively restrained in position as well as in direction at both the ends carries an axial load of 1250 KN. Design suitable I section, if the column is encased in concrete. Take $f_y = 250$ N/mm².

Q.9 Attempt the following.

- a) State the basic theorems of plastic analysis.
- b) What are the conditions to fulfill for a encased beam?
- c) Find the shape factor for a circular section.
T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Use of IS Codes & Steel Table are allowed.
- 4) Use of scientific non-programmable calculator is allowed.
- 5) Assume additional data if required and mention it clearly.
- 6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1

Seat No.

- Choose the correct alternatives from the options and rewrite the sentence. 1)
 - The critical stress of the plate in light gauge section is given by _____
 - a) $f_{ck} = \pi^2 E / [12(1 \mu^2)(w/t)^2]$ b) $f_{ck} = \pi^2 E / [12(1 \mu)(w/t)^2]$ c) $f_{ck} = \pi^2 E / [12(1 \mu^2)(w/t)]$ d) $f_{ck} = \pi^2 E / [12(1 \mu)(w/t)]$ $f_{ck} = \pi^2 E / [12(1 - \mu^2)(w/t)]$

2) The bending stress compression in web Fw due to bending moments in a beam section of light gauge steel should not exceed

- $\mathsf{Fw} \le 3200 \overline{00/(\mathsf{h}/\mathsf{t})}^2$ a) Fw $\leq 300000/(h/t)^2$ b)
- c) $Fw \le 3586000/(h/t)^2$ d) $Fw \ge 300000/(h/t)^2$
- For design of railway bridges, the permissible primary stresses are 3) increase by _____ when wind loading is considered in addition to dead load, live load, longitudinal, racking and impact forces.
 - 16.67% 33.33% a) b)
 - 25% d) 40% c)
- The shape factor for thin tubular section is 4)
 - a) 1.27 b) 1.15
 - 1.7 c) 1.5 d)

5) The permissible stress in axial compression is dependent upon .

- a) only on effective length of the column
- only on the vield stress of member b)
- c) only on least radius of gyration
- d) all of these
- Classify the ISLB 300@37.7kg/m. 6)
 - a) plastic compact b)
 - c) semi compact d) slender
- Sliding plate bearing are suitable for 7) b)
 - a) spans less than 10 m c) spans more than 50 m
 - suspension bridges d)

spans more than 10 m to 50 m

- 8) In elastic analysis _____ Condition/s occurs. Equilibrium condition
 - Mechanism condition b) a)
 - None of the above Plastic moment condition d) c)

Max. Marks: 70

Marks: 14



- 9) The provision for expansion and contraction should be made such as to permit movements of free bearings to the extent not less than for every 30m length equal to _____.
 - a) 20mm b) 25mm
 - c) 30mm d) 40mm
- 10) The bearings no pin shall be of diameter less than _____.
 - a) 8 cm b) 10 cm c) 12 cm d) 15 cm
- 11) The fully plastic moment Mp of rectangular section of breadth b and depth
 - d is given by _____. a) $Mp = fybd^2/6$ b) Mp
 - a) $Mp = fybd^2/6$ b) $Mp = fybd^2/4$ c) $Mp = fybd^2/12$ d) $Mp = fybd^2/8$
- 12) Which approximate method of analysis of building frames for lateral loads is/are more accurate?
 - a) portal method b) cantilever method
 - c) factor method d) all of these
- 13) In static theorem or lower bound theorem the relation between the value of W and collapse load Wc is _____.
 - a) $W \le Wc$ b) W = Wc
 - c) $W \ge Wc$ d) None of these
- 14) The effective width b for a light gauge steel plate is given by _____.
 - a) $b = 0.9 (E/Fy)^{1/2}$ b) $1.9 (E/Fy)^{1/2}$
 - c) 2.9 (E/Fy)^{1/2}

- d) $3.9 (E/Fy)^{1/2}$
- d) 3.9

_	_		
Page	6	of	12

09

09

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- **Instructions:** 1) From Section I Q. No.2 is compulsory and attempts any two questions from remaining questions.
 - 2) From Section II Q. No.7 is compulsory and attempts any two questions from remaining questions.
 - 3) Figures to the right indicate full marks.
 - 4) Use of IS Codes & Steel Table are allowed.
 - 5) Use of scientific non-programmable calculator is allowed.
 - 6) Assume additional data if required and mention it clearly.
 - 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Design the central bottom cord of the N type truss provided for the foot bridge of effective span 20m having clear width of 2.5m. The flooring consists of timber planks of 6cms. Assume self weight of timber plank as 8000N/m³. Live load of 4000N/m². Provide 10 panels of 2m each, keeping the height of main truss as 1.8m for N type truss.
- Q.3 Explain cantilever method for analyzing a building frame subjected to horizontal 09 forces. Also write the assumptions made in the analysis.
- Q.4 Design a light gauge steel section of a column of 4m long to carry a load of 200KN.

Q.5 Attempt the following.

- a) Explain the advantages and disadvantages of using cold framed light gauge steel members.
- b) Write a short note on roller bearing with neat sketch.
- c) Compare the merits of factor method with cantilever method of analysis of lateral loads.

Section – II

- Q.6 Design the continues beam ABCD for a load of 1000N/m throughout the span 09 ABCD. Take load factor of 1.85.
- **Q.7** A portal frame ABCD fixed at A and D, subjected to a loading of 40KN at midpoint of beam BC and 20KN at B acting towards right. The plastic moment capacities for the beams and columns being M_1 and M_2 respectively. Compute the values of M_1 and M_2 for the frame to have minimum weight. Take AB = CD = 3.0 m and BC = 9m.
- **Q.8** A column 4.2m in height and effectively restrained in position as well as in direction at both the ends carries an axial load of 1250 KN. Design suitable I section, if the column is encased in concrete. Take $f_y = 250$ N/mm².

Q.9 Attempt the following.

- a) State the basic theorems of plastic analysis.
- b) What are the conditions to fulfill for a encased beam?
- c) Find the shape factor for a circular section.



Set

Seat No.

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Use of IS Codes & Steel Table are allowed.
- 4) Use of scientific non-programmable calculator is allowed.
- 5) Assume additional data if required and mention it clearly.
- 6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

- 14 Q.1 Choose the correct alternatives from the options and rewrite the sentence. Which approximate method of analysis of building frames for lateral loads 1)
 - is/are more accurate? a) portal method
- cantilever method b)
- c) factor method d) all of these
- 2) In static theorem or lower bound theorem the relation between the value of W and collapse load Wc is _
 - a) $W \leq Wc$ b) W = Wc
 - c) $W \ge Wc$ d) None of these
- 3) The effective width b for a light gauge steel plate is given by ____
 - a) $b=0.9 (E/Fy)^{1/2}$ 1.9 (E/Fy)^{1/2} b)
 - c) 2.9 (E/Fv)^{1/2} 3.9 (E/Fv)^{1/2} d)
- The critical stress of the plate in light gauge section is given by _____ 4)
 - a) $f_{ck} = \pi^2 E / [12(1 \mu^2)(w/t)^2]$ b) $f_{ck} = \pi^2 E / [12(1 \mu)(w/t)^2]$ c) $f_{ck} = \pi^2 E / [12(1 \mu^2)(w/t)]$ d) $f_{ck} = \pi^2 E / [12(1 \mu)(w/t)]$
- 5) The bending stress compression in web Fw due to bending moments in a beam section of light gauge steel should not exceed
 - $\mathsf{Fw} \le 3200 \overline{00/(\mathsf{h}/\mathsf{t})}^2$ a) Fw $\leq 300000/(h/t)^2$ b)
 - c) $Fw \le 3586000/(h/t)^2$ d) $Fw \ge 300000/(h/t)^2$
- 6) For design of railway bridges, the permissible primary stresses are increase by _____ when wind loading is considered in addition to dead load, live load, longitudinal, racking and impact forces.
 - 16.67% 33.33% a) b) 25% d) 40% c)
- 7) The shape factor for thin tubular section is _____.

a)	1.27	b)	1.15
C)	1.5	d)	1.7

Max. Marks: 70

Marks: 14

				Set	R
8)	The a) b) c) d)	e permissible stress in axial comp only on effective length of the co only on the yield stress of memb only on least radius of gyration all of these	ressio olumn oer	on is dependent upon	
9)	Cla a) c)	ssify the ISLB <u>300@37.7kg/m.</u> plastic semi compact	b) d)	compact slender	
10)	Slid a) c)	ling plate bearing are suitable for spans less than 10 m spans more than 50 m	b) d)	 spans more than 10 m to 50 m suspension bridges	
11)	In e a) c)	elastic analysis Condition/s Mechanism condition Plastic moment condition	b) d)	irs. Equilibrium condition None of the above	
12)	The per 30n a) c)	e provision for expansion and con mit movements of free bearings t n length equal to 20mm 30mm	traction o the b) d)	on should be made such as to extent not less than for every 25mm 40mm	
13)	The a) c)	e bearings no pin shall be of diam 8 cm 12 cm	eter l b) d)	ess than 10 cm 15 cm	
4 4)	ть -	fully also the second of Marsh and a			

- The fully plastic moment Mp of rectangular section of breadth b and depth 14) d is given by _____. a) $Mp = fybd^2/6$ c) $Mp = fybd^2/12$ _.
 - b)
 - $Mp = fybd^2/4$ $Mp = fybd^2/8$ d)

		-	
Page	9	of	12

09

09

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM Max. Marks: 56

Instructions: 1) From Section - I Q. No.2 is compulsory and attempts any two questions from remaining questions.

- 2) From Section II Q. No.7 is compulsory and attempts any two questions from remaining questions.
- 3) Figures to the right indicate full marks.
- 4) Use of IS Codes & Steel Table are allowed.
- 5) Use of scientific non-programmable calculator is allowed.
- 6) Assume additional data if required and mention it clearly.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Design the central bottom cord of the N type truss provided for the foot bridge of effective span 20m having clear width of 2.5m. The flooring consists of timber planks of 6cms. Assume self weight of timber plank as 8000N/m³. Live load of 4000N/m². Provide 10 panels of 2m each, keeping the height of main truss as 1.8m for N type truss.
- Q.3 Explain cantilever method for analyzing a building frame subjected to horizontal 09 forces. Also write the assumptions made in the analysis.
- Q.4 Design a light gauge steel section of a column of 4m long to carry a load of 200KN.

Q.5 Attempt the following.

- a) Explain the advantages and disadvantages of using cold framed light gauge steel members.
- b) Write a short note on roller bearing with neat sketch.
- c) Compare the merits of factor method with cantilever method of analysis of lateral loads.

Section – II

- Q.6 Design the continues beam ABCD for a load of 1000N/m throughout the span 09 ABCD. Take load factor of 1.85.
- **Q.7** A portal frame ABCD fixed at A and D, subjected to a loading of 40KN at midpoint of beam BC and 20KN at B acting towards right. The plastic moment capacities for the beams and columns being M_1 and M_2 respectively. Compute the values of M_1 and M_2 for the frame to have minimum weight. Take AB = CD = 3.0 m and BC = 9m.
- **Q.8** A column 4.2m in height and effectively restrained in position as well as in direction at both the ends carries an axial load of 1250 KN. Design suitable I section, if the column is encased in concrete. Take $f_y = 250$ N/mm².

Q.9 Attempt the following.

- a) State the basic theorems of plastic analysis.
- b) What are the conditions to fulfill for a encased beam?
- c) Find the shape factor for a circular section.



Seat No.

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ADVANCED DESIGN OF STEEL STRUCTURES**

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Use of IS Codes & Steel Table are allowed.
- 4) Use of scientific non-programmable calculator is allowed.
- 5) Assume additional data if required and mention it clearly.
- 6) Draw the appropriate sketches whenever necessary.

Choose the correct alternatives from the options and rewrite the

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1

sen	tence.
1)	For design of railway bridges, the permissible primary stresses are
	increase by when wind loading is considered in addition to dead
	load, live load, longitudinal, racking and impact forces.

- 16.67% 33.33% b) a)
- c) 25% d) 40%
- 2) The shape factor for thin tubular section is
 - a) 1.27 b) 1.15
 - c) 1.5 d) 1.7
- 3) The permissible stress in axial compression is dependent upon _____.

b)

- only on effective length of the column a)
- only on the yield stress of member b)
- c) only on least radius of gyration
- d) all of these

4) Classify the ISLB 300@37.7kg/m.

a) plastic

c)

c) semi compact d) slender

Sliding plate bearing are suitable for 5)

- spans less than 10 m b) spans more than 10 m to 50 m a)
- c) spans more than 50 m suspension bridges d)
- In elastic analysis Condition/s occurs. 6)
 - Mechanism condition a)
 - Plastic moment condition
- 7) The provision for expansion and contraction should be made such as to permit movements of free bearings to the extent not less than for every 30m length equal to _____.
 - a) 20mm b) 25mm d) 40mm
 - 30mm c)
- b) d)

compact

SLR-FM-37

Max. Marks: 70

Set

Marks: 14

- Equilibrium condition
- None of the above

SLR-FM-37 Set

- The bearings no pin shall be of diameter less than _____. 8)
 - a) 8 cm b) 10 cm
 - c) 12 cm d) 15 cm
- 9) The fully plastic moment Mp of rectangular section of breadth b and depth d is given by
 - a) $Mp = fybd^2/6$ b) $Mp = fybd^2/4$
 - c) Mp = $fybd^2/12$ $Mp = fybd^2/8$ d)
- Which approximate method of analysis of building frames for lateral loads 10) is/are more accurate?
 - cantilever method a) portal method b)
 - c) factor method all of these d)
- In static theorem or lower bound theorem the relation between the value 11) of W and collapse load Wc is _
 - b) a) $W \leq Wc$ W = Wc
 - c) $W \ge Wc$ d) None of these

The effective width b for a light gauge steel plate is given by _____. 12) 1.9 (E/Fy)^{1/2}

- a) $b=0.9 (E/Fy)^{1/2}$ b)
 - c) 2.9 (E/Fy)^{1/2} 3.9 (E/Fy)^{1/2} d)
- The critical stress of the plate in light gauge section is given by _ 13)
 - a) $f_{ck} = \pi^2 E / [12(1 \mu^2)(w/t)^2]$ b) $f_{ck} = \pi^2 E / [12(1 \mu)(w/t)^2]$ c) $f_{ck} = \pi^2 E / [12(1 \mu^2)(w/t)]$ d) $f_{ck} = \pi^2 E / [12(1 \mu)(w/t)]$
- The bending stress compression in web Fw due to bending moments in a 14) beam section of light gauge steel should not exceed
 - $\mathsf{Fw} \le 3200 \overline{00/(\mathsf{h}/\mathsf{t})}^2$ a) Fw $\leq 300000/(h/t)^2$ b)
 - c) $Fw \le 3586000/(h/t)^2$ $Fw \ge 300000/(h/t)^2$ d)

_		~	
Page	12	ot	12

09

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF STEEL STRUCTURES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) From Section - I Q. No.2 is compulsory and attempts any two questions from remaining questions.

- 2) From Section II Q. No.7 is compulsory and attempts any two questions from remaining questions.
- 3) Figures to the right indicate full marks.
- 4) Use of IS Codes & Steel Table are allowed.
- 5) Use of scientific non-programmable calculator is allowed.
- 6) Assume additional data if required and mention it clearly.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Design the central bottom cord of the N type truss provided for the foot bridge of effective span 20m having clear width of 2.5m. The flooring consists of timber planks of 6cms. Assume self weight of timber plank as 8000N/m³. Live load of 4000N/m². Provide 10 panels of 2m each, keeping the height of main truss as 1.8m for N type truss.
- Q.3 Explain cantilever method for analyzing a building frame subjected to horizontal 09 forces. Also write the assumptions made in the analysis.
- **Q.4** Design a light gauge steel section of a column of 4m long to carry a load of **09** 200KN.

Q.5 Attempt the following.

- a) Explain the advantages and disadvantages of using cold framed light gauge steel members.
- b) Write a short note on roller bearing with neat sketch.
- c) Compare the merits of factor method with cantilever method of analysis of lateral loads.

Section – II

- Q.6 Design the continues beam ABCD for a load of 1000N/m throughout the span 09 ABCD. Take load factor of 1.85.
- **Q.7** A portal frame ABCD fixed at A and D, subjected to a loading of 40KN at midpoint of beam BC and 20KN at B acting towards right. The plastic moment capacities for the beams and columns being M_1 and M_2 respectively. Compute the values of M_1 and M_2 for the frame to have minimum weight. Take AB = CD = 3.0 m and BC = 9m.
- **Q.8** A column 4.2m in height and effectively restrained in position as well as in direction at both the ends carries an axial load of 1250 KN. Design suitable I section, if the column is encased in concrete. Take $f_y = 250$ N/mm².

Q.9 Attempt the following.

- a) State the basic theorems of plastic analysis.
- b) What are the conditions to fulfill for a encased beam?
- c) Find the shape factor for a circular section.



T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to the right indicate full marks.

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

b)

d)

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- action changes characteristics of stream when wastewater is 1) discharge into it.
 - reaeration a)
 - b) dilution deoxygenation d) sedimentation c)

2) Most polluted zone in self-purification process is _____. Zone of recoverv

- Zone of active decomposition a)
- Zone of pure water C)
- 3) _ phase of microorganisms growth is last phase of their life. log growth
 - endogenous growth a) b)
 - all of above lag growth d) C)

Aerobic condition in effluent treatment can be achieved by the use of _____. 4) diffused aeration

- dissolved oxygen a) c)
 - b) coagulation d) sludge control
- is meant for reduction of moisture content of sludge. 5)
 - dewatering conditionina a) b) All of above
 - thickening d) C)
- is the process of removal of non-biodegradable organics using fixed 6) bed of activated carbon column.
 - adsorption b) reverse osmosis a) c)
 - electrodialysis d)

For a conventional sludge digesters detention period of _____ is provided. 7) 30 to 90 days

- 20 to 30 minutes a)
- b) 4 to 6 hrs. d) 1 to 2 days C)
- Molases is waste product of _____ industry. 8)
 - textile b) pulp and paper a) c)
 - tannery sugar d)
- Yeast sludge containing rich in proteins, carbohydrates vitamins are 9) treated separately for _____. b) recycle
 - segregation a)
 - byproduct recovery d) high efficiency c)

- chemical precipitation

Zone of degradation



Max. Marks: 70

Marks: 14

Set

10)	a) c)	sulphitation aeration	b) d)	dechlorination coagulation
11)	micro	_ involves the exposure of waste obiological population.	in ind	creasing the concentration of
	a)	nitrifying of bacteria	b)	denitrifying of bacteria
	c)	acclimatization of bacteria	d)	photosynthesis
12)	Ferm	nentation is one of the process of		_ Industry.
	a)	pulp and paper	b)	distillery industry
	c)	sugar industry	d)	dairy industry
13)	Exce	ess lime treatment is practiced for stry.	wast	ewater treatment of
	a)	pulp and paper	b)	distillerv industrv
	c	sugar industry	d)	dairy industry
	ς,	ougai madou y	ω,	

- _____ industry wastewater has highest BOD value. 14) distillery industry b)
 - pulp and paper a) c)
 - sugar industry d)

process

dairy industry

- SLR-FM-38 Set P
- 10) In the sugar mill the clarified juice is bleached by

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering

INDUSTRIAL WASTE TREATMENT Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no.3 from Section-I is compulsory. solve any two question from remaining question.

- 2) Question no.8 from Section-I is compulsory. solve any two question from remaining question.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary and mention it clearly.
- 5) Use of non-programmable calculator is allowed.

Section - I

Q.2 a) Define

- i) Grab sample
- ii) Composite sample
- iii) Population equivalent
- iv) Relative stability
- b) Define Water Quality Index. List various methods used for determination
 05 of WQI. Explain any one method in detail.
- Q.3 a) Compute reaction rate constant and ultimate BOD using method of least square method for the following BOD test data for a stream receiving some treated effluent.

t (days)	2	4	6	8	10
y (mg/Lit)	11	18	22	24	26

- Explain in detail self-purification of stream process. 05 b) Q.4 Explain in detail Waste Strength reduction. 05 a) Write Strreter Phelps equation and explain each and every term used in it. 04 b) Q.5 a) Write short note on : 09 Waste volume reduction i) ii) Electro dialysis process iii) Neutralization Section - II Q.6 Explain with flow diagram the "Massive Lime Treatment" for color removal a) 05 in pulp and paper mill. If wastewater discharge is allowed in surface waters, then what are 04 b) possible effects on water quality? Explain. Q.7 Give the characteristics of wastewater, draw the wastewater treatment flow diagram and explain in detail. Distillery 04 a)
 - b) Sugar industry 05

Max. Marks: 56

Set

SLR-FM-38

Seat No.

rom

	Set	Ρ
Q.8	 Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Tannery Industries b) Paper and pulp mill 	05 05
Q.9	 Write short note. a) Operation and maintenance requirement b) Water Pollution Control Act c) Constructed wetlands for treatment of wastewater 	09

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to the right indicate full marks.

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Molases is waste product of _____ industry. 1)
 - a) textile b) pulp and paper
 - c) sugar d) tannery
- 2) Yeast sludge containing rich in proteins, carbohydrates vitamins are treated separately for _____.
 - a) segregation b) recvcle
 - high efficiency byproduct recovery c) d)
- 3) In the sugar mill the clarified juice is bleached by _____ process.
 - sulphitation dechlorination a) b)
 - C) aeration d) coagulation
- _ involves the exposure of waste in increasing the concentration of 4) microbiological population. denitrifying of bacteria
 - nitrifving of bacteria a) b)
 - acclimatization of bacteria d) photosynthesis
- Fermentation is one of the process of _____ Industry. 5) distillery industry
 - pulp and paper b) a)
 - sugar industry dairy industry d) C)
- Excess lime treatment is practiced for wastewater treatment of _____ 6) industry.
 - pulp and paper distillery industry a) b)
 - sugar industry dairy industry c) d)
- 7) _ industry wastewater has highest BOD value.
 - pulp and paper distillery industry b) a) sugar industry dairy industry c) d)
 - action changes characteristics of stream when wastewater is
- 8) discharge into it. reaeration dilution a) b)

Zone of degradation

- deoxygenation sedimentation c) d)
- Most polluted zone in self-purification process is _ 9) Zone of recovery b)
 - Zone of active decomposition a) C)
 - Zone of pure water d)

Max. Marks: 70

Marks: 14

SLR-FM-38

Set

Q

- 10) _____ phase of microorganisms growth is last phase of their life.
 - a) endogenous growth
- b) log growth
- c) lag growth
- d) all of above
- 11) Aerobic condition in effluent treatment can be achieved by the use of _____.
 - a) dissolved oxygenc) coagulation
- b) diffused aerationd) sludge control

Set Q

- 12) _____ is meant for reduction of moisture content of sludge.
 - a) dewatering

C)

- b) conditioning
- thickening
 - d) All of above
- 13) _____ is the process of removal of non-biodegradable organics using fixed bed of activated carbon column.
 - a) adsorptionc) electrodialysis

- b) reverse osmosis
- d) chemical precipitation
- 14) For a conventional sludge digesters detention period of _____ is provided.
 - a) 20 to 30 minutes
 - c) 4 to 6 hrs.

b) 30 to 90 daysd) 1 to 2 days

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no.3 from Section-I is compulsory. solve any two question from remaining question.

- 2) Question no.8 from Section-I is compulsory. solve any two question from remaining question.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary and mention it clearly.
- 5) Use of non-programmable calculator is allowed.

Section - I

Q.2 a) Define

- i) Grab sample
- ii) Composite sample
- iii) Population equivalent
- iv) Relative stability
- b) Define Water Quality Index. List various methods used for determination 05 of WQI. Explain any one method in detail.
- Q.3 a) Compute reaction rate constant and ultimate BOD using method of least square method for the following BOD test data for a stream receiving some treated effluent.

t (days)	2	4	6	8	10
y (mg/Lit)	11	18	22	24	26

- b) Explain in detail self-purification of stream process. 05 Q.4 Explain in detail Waste Strength reduction. 05 a) Write Strreter Phelps equation and explain each and every term used in it. 04 b) Q.5 a) Write short note on : 09 Waste volume reduction i) ii) Electro dialysis process iii) Neutralization Section - II Q.6 Explain with flow diagram the "Massive Lime Treatment" for color removal a) 05 in pulp and paper mill. If wastewater discharge is allowed in surface waters, then what are 04 b)
- **Q.7** Give the characteristics of wastewater , draw the wastewater treatment flow diagram and explain in detail.

possible effects on water quality? Explain.

a)	Distillery	04
b)	Sugar industry	05

Max. Marks: 56

SLR-FM-38

Seat No.

Set Q

	:	Set	Q
Q.8	 Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Tannery Industries b) Paper and pulp mill 	k	05 05
Q.9	 Write short note. a) Operation and maintenance requirement b) Water Pollution Control Act c) Constructed wetlands for treatment of wastewater 		09

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to the right indicate full marks.

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

b)

d)

d)

conditioning

All of above

30 to 90 days

chemical precipitation

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

MCQ/Objective Type Questions

is meant for reduction of moisture content of sludge. 1)

- a) dewatering
- thickening C)
- is the process of removal of non-biodegradable organics using fixed 2) bed of activated carbon column. reverse osmosis
 - a) adsorption b) d)
 - electrodialysis C)
- For a conventional sludge digesters detention period of is provided. 3)
 - 20 to 30 minutes b) a)
 - 1 to 2 days C) 4 to 6 hrs. d)
- Molases is waste product of _____ industry. 4)
 - textile b) pulp and paper a)
 - c) sugar d) tannerv
- Yeast sludge containing rich in proteins, carbohydrates vitamins are 5) treated separately for _____. b) recycle
 - a) segregation
 - c) byproduct recovery
- In the sugar mill the clarified juice is bleached by process. 6)
 - sulphitation dechlorination a) b)
 - C) aeration d) coagulation
- 7) involves the exposure of waste in increasing the concentration of microbiological population.
 - nitrifying of bacteria a)
 - acclimatization of bacteria C)
- b) denitrifying of bacteria

high efficiency

- photosynthesis d)
- 8) Fermentation is one of the process of _____ ____ Industry.
 - pulp and paper b) distillery industry a) sugar industry C)
 - d) dairy industry
- 9) Excess lime treatment is practiced for wastewater treatment of _____ industry.
 - pulp and paper distillery industry a) b)
 - sugar industry dairy industry c) d)

Max. Marks: 70

Marks: 14

Set R

- 10) _____ industry wastewater has highest BOD value.
 - b) distillery industry
 - c) sugar industry

pulp and paper

d) dairy industry

SLR-FM-38

Set R

- 11) _____ action changes characteristics of stream when wastewater is discharge into it.
 - a) reaeration

a)

C)

- b) Dilution
- deoxygenation d) Sedimentation
- 12) Most polluted zone in self-purification process is _____.
 - a) Zone of active decomposition
 - c) Zone of pure water
- b) Zone of recoveryd) Zone of degradation
- 13) _____ phase of microorganisms growth is last phase of their life.
 - a) endogenous growthc) lag growth
- b) log growthd) all of above
- 14) Aerobic condition in effluent treatment can be achieved by the use of _____.
 - a) dissolved oxygenc) coagulation
- b) diffused aerationd) sludge control

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no.3 from Section-I is compulsory. solve any two question from remaining question.

- 2) Question no.8 from Section-I is compulsory. solve any two question from remaining question.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary and mention it clearly.
- 5) Use of non-programmable calculator is allowed.

Section - I

Q.2 a) Define

- Grab sample i)
- Composite sample ii)
- iii) Population equivalent
- iv) Relative stability
- Define Water Quality Index. List various methods used for determination 05 b) of WQI. Explain any one method in detail.
- Compute reaction rate constant and ultimate BOD using method of least 05 Q.3 a) square method for the following BOD test data for a stream receiving some treated effluent.

t (days)	2	4	6	8	10
y (mg/Lit)	11	18	22	24	26

Explain in detail self-purification of stream process. 05 b) Q.4 Explain in detail Waste Strength reduction. 05 a) Write Strreter Phelps equation and explain each and every term used in it. 04 b) 09

Q.5 a) Write short note on :

- Waste volume reduction i)
- ii) Electro dialysis process
- iii) Neutralization

Section - II

- Q.6 Explain with flow diagram the "Massive Lime Treatment" for color removal a) 05 in pulp and paper mill. If wastewater discharge is allowed in surface waters, then what are 04 b) possible effects on water quality? Explain. Q.7 Give the characteristics of wastewater, draw the wastewater treatment flow diagram and explain in detail. Distillery 04 a)
 - Sugar industry b) 05

Set R

Max. Marks: 56

SLR-FM-38

04

Seat No.

	5	Set R
Q.8	Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail.	25
	a) Lannery Industries	05
	b) Paper and pulp mill	05
Q.9	 Write short note. a) Operation and maintenance requirement b) Water Pollution Control Act c) Constructed wetlands for treatment of wastewater 	09

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Figures to the right indicate full marks.

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

b)

d)

photosynthesis

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In the sugar mill the clarified juice is bleached by ____ 1) process.
 - sulphitation dechlorination a) b)
 - aeration C) d) coagulation
- involves the exposure of waste in increasing the concentration of 2) microbiological population. denitrifying of bacteria
 - nitrifying of bacteria a)
 - acclimatization of bacteria c)
- Fermentation is one of the process of _____ Industry. 3)
 - distillery industry pulp and paper a) b)
 - dairy industry sugar industry d) C)
- 4) Excess lime treatment is practiced for wastewater treatment of _____ industry.
 - a) pulp and paper b)
 - c) d)
- 5)
 - a)
 - C)
- _ action changes characteristics of stream when wastewater is 6) discharge into it.
 - a) reaeration

c)

- d) c) deoxygenation
- 7) Most polluted zone in self-purification process is _____
 - Zone of active decomposition a)
 - c)
- phase of microorganisms growth is last phase of their life. 8)
 - endogenous growth a) b)
 - C)
- 9) Aerobic condition in effluent treatment can be achieved by the use of _____. dissolved oxygen a)
 - diffused aeration b) sludge control
 - coagulation d)

Max. Marks: 70

SLR-FM-38



S

- Marks: 14

10) is meant for reduction of moisture content of sludge.

a) dewatering b) conditioning

C) thickening

- All of above d)
- is the process of removal of non-biodegradable organics using fixed 11) bed of activated carbon column.
 - a) adsorption

C)

C)

a)

C)

b) reverse osmosis

SLR-FM-38

Set S

- electrodialysis d) chemical precipitation
- For a conventional sludge digesters detention period of _____ is provided. 12)
 - 20 to 30 minutes a) 4 to 6 hrs.

- b) 30 to 90 days d) 1 to 2 days
- Molases is waste product of _____ industry. 13)
 - b) pulp and paper
 - d) tannery
- Yeast sludge containing rich in proteins, carbohydrates vitamins are 14) treated separately for _____.
 - a) segregation

textile

sugar

- C) byproduct recovery
- b) recycle
- d) high efficiency

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

INDUSTRIAL WASTE TREATMENT

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no.3 from Section-I is compulsory. solve any two question from remaining question.

- 2) Question no.8 from Section-I is compulsory. solve any two question from remaining question.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary and mention it clearly.
- 5) Use of non-programmable calculator is allowed.

Section - I

Q.2 a) Define

- i) Grab sample
- ii) Composite sample
- iii) Population equivalent
- iv) Relative stability
- b) Define Water Quality Index. List various methods used for determination 05 of WQI. Explain any one method in detail.
- Q.3 a) Compute reaction rate constant and ultimate BOD using method of least square method for the following BOD test data for a stream receiving some treated effluent.

t (days)	2	4	6	8	10
y (mg/Lit)	11	18	22	24	26

- Explain in detail self-purification of stream process. 05 b) Q.4 Explain in detail Waste Strength reduction. 05 a) Write Strreter Phelps equation and explain each and every term used in it. 04 b) Q.5 a) Write short note on : 09 Waste volume reduction i) ii) Electro dialysis process iii) Neutralization Section - II Q.6 Explain with flow diagram the "Massive Lime Treatment" for color removal a) 05 in pulp and paper mill. If wastewater discharge is allowed in surface waters, then what are 04 b) possible effects on water quality? Explain.
- **Q.7** Give the characteristics of wastewater , draw the wastewater treatment flow diagram and explain in detail.

a)	Distillery	04
b)	Sugar industry	05

SLR-FM-38

Set S

Max. Marks: 56



	Set	S
Q.8	 Draw manufacturing process flow diagram, indicate the sources wastes and explain in detail. a) Tannery Industries b) Paper and pulp mill 	05 05
Q.9	 Write short note. a) Operation and maintenance requirement b) Water Pollution Control Act c) Constructed wetlands for treatment of wastewater 	09

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

WATER POWER ENGINEERING Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Draw neat labeled diagrams whenever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - The capacity of small hydro power plant are in order of _____. 1)
 - a) 20-5 MW 15-100 MW b)
 - c) 1-15 MW d) 15-20 MW
 - Power plant having maximum demand more than the installed rated 2) capacity will have utilization factor
 - a) Equal to unity b)
 - c) Less than unity d) None
 - Which plant can never have 100 percent load factor? 3)
 - a) Base load plant
 - b) c) Nuclear power plant d)
 - 4) Function of surge tank is to ____
 - Store water on load rejection a)
 - b) Furnish additional water during increased load demand
 - c) Both to store and supply water
 - d) None
 - 5) Unit power of turbine is _____.
 - a) P/H^{3/2} P/H b) P/H^2 c) P/√H d)
 - Pump storage scheme are used to improve _____. 6)
 - a) Load factor
 - b) Power factor
 - c) Plant capacity factor as well as load factor
 - d) Delivery factor
 - Cavitation in a turbine causes _____. 7)
 - a) Low efficiency
 - b) Blade surface is damaged
 - c) Vibration and noise
 - d) None of the above

SLR-FM-39



Max. Marks: 70

More than unity

Peak load plant

Hydroelectric plant

Marks: 14

Set 8) The draft tube is provided to . a) reduce the effect of water hammer b) raise the water surface of the stream to create an artificial head c) increase the acting head on the water wheel d) none of the above 9) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called _____. Spillways a) Penstock b) c) Reservoir Fore bay d) 10) Jet ratio 'm' is defined as the ratio of a) Diameter of jet of water to diameter of pelton wheel. Velocity of vane to velocity of jet of water b) c) Velocity of flow to velocity of jet of water d) Diameter of pelton wheel to diameter of jet Water hammer' process in penstock result in _____. 11) a) pressure decreases b) noise decreases c) noise increases, pressure increases, velocity decreases d) None 12) The load factor for the peak day of the year determines the required Water storage a) b) Pondage c) Generating capacity d) None 13) In Francis turbine runner, the number of blades is usually of the order of 16-24 12-14 a) b)

- c) 6-8 d) 3-6
- Surge tank is necessarily provided _ 14) short length penstocks
 - a) long penstocks b)
 - c) surface penstocks embedded penstocks d)

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from Section one (Que.no.2 to 4) and attempt any two questions from section two (Que. no. 5 to 7).

- 2) Figures to the right indicates full marks.
- 3) Draw neat labeled diagrams whenever necessary.
- 4) Use of only non programmable calculator is allowed.
- 5) Assume suitable data wherever necessary.

Section – I

Q.2	a)	What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?	07
	b)	When a run of river plant operates as a peak load stations with a weekly load factor of 21%, all its capacity is firm capacity. What will be the minimum flow in the river so that the station may serve as the base load stations. It is given that, installed capacity of generator = 14,000 kW, Operating Head = 14 m, Plant efficiency = 82%, also estimate the daily load factor of the plant if the stream flow is 20 cumcs.	07
Q.3	a)	Define Hydrograph and explain its importance in the design of storage type hydro electric power plant.	05
	b)	Common load shared by two stations base load plant with 50 MW capacity	05
		\cdot	

- and other being standby plant with 55 MW capacity. The yearly output for base load station is 210×10^{6} KWh and for standby station is 18×10^{6} KWh. The peak load taken by standby station is 17 MW which works for 2424 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- c) What is a surge tank and are its functions? Describe different types of 04 surge tanks.
- Q.4 a) A penstock, with an internal diameter 1.25 m, supplies water at a head equivalent to 18.7 kg/cm². There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1020 kg/m² and 85% resp. Find the wall thickness of penstock.
 - b) What are the principal components of a 'Hydro-electric' scheme? Discuss
 04 the utility of each component.
 - c) What do you understand by 'Water Hammer' in pipe line? Derive an expression for the water hammer pressure in case of rigid pipe.

Max. Marks: 56

Set P

SLR-FM-39 Set P

Section – II

Q.5	a)	The following data refers to a proposed hydroelectric power plant, available Head = 27 m, catchment area = 400 km^2 a Rainfall = 150 cm/yr , of total rain fall utilized = 7.5%, turbine efficiency 82%, penstock efficiency 85%, generator efficiency 86%, load factor 0.42, calculate the power that can be developed suggest suitable turbine for the plant.	07
	b)	What do you understand by 'pump storage plant'? What are the advantages and disadvantages of this power plant? Where can such schemes to be applied?	07
Q.6	a) b)	What do you understand by the term 'specific speed' of a turbine? What information does it give and how it is made use in practice? A Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 71000 kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 %. The four units together will provide for a power of 348000 hp at a efficiency of 91 %. The nozzle efficiency is 0.98. Find:	04 06
	c)	 the design discharge for the turbine jet dia, and no. of jets the nozzle tip diameter the pitch circle dia. of the wheel the specific speed and number of buckets on the wheel Explain the function of Anchor block and enlist the forces acting on it? Draw a neat figure. 	04
Q.7	a)	In an estuary, which is being considered for possible tidal power generation during tidal cycle, the observed difference between high and low water of the tide was 5.0 m. It has been estimated this estuary having an area of 0.45 km ² can generate power of 3 hours in each cycle. Assuming the average available head to be 4.0 m and the overall efficiency of the generation to 77%. Calculate the power (hp) at any instant and the total energy in a year. Take Density of sea water as 1025kg/m ³	06
	b)	Describe how ocean tides are generated. With tidal cycle in view, describe how hydropower can be generated. Enumerate the limitations of tidal power generation	04
	c)	Explain the terms: 1) Draft tube	04

2) Trash rack

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** WATER POWER ENGINEERING

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Draw neat labeled diagrams whenever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

3)

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) The draft tube is provided to .
 - a) reduce the effect of water hammer
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above

2) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called _____.

- a) Penstock b) Spillways c) Reservoir d) Fore bay
- Jet ratio 'm' is defined as the ratio of _____
- a) Diameter of jet of water to diameter of pelton wheel.
 - b) Velocity of vane to velocity of jet of water
 - c) Velocity of flow to velocity of jet of water
 - d) Diameter of pelton wheel to diameter of jet
- 4) Water hammer' process in penstock result in _____.
 - a) pressure decreases
 - b) noise decreases
 - c) noise increases, pressure increases, velocity decreases
 - d) None
- 5) The load factor for the peak day of the year determines the required

a)	Water storage	b)	Pondage
c)	Generating capacity	d)	None

- 6) In Francis turbine runner, the number of blades is usually of the order
 - of _____. a) 16-24 b) 12-14
 - c) 6-8 d) 3-6
- 7) Surge tank is necessarily provided
 - a) long penstocks b) short length penstocks c) surface penstocks
 - embedded penstocks d)



Max. Marks: 70

Marks: 14

- The capacity of small hydro power plant are in order of . 8)
 - a) 20-5 MW

b) 15-100 MW 15-20 MW

SLR-FM-39

Set C

- c) 1-15 MW
- 9) Power plant having maximum demand more than the installed rated capacity will have utilization factor _

d)

- More than unity a) Equal to unity b)
- c) Less than unity d) None
- Which plant can never have 100 percent load factor? 10) Peak load plant
 - a) Base load plant b)
 - c) Nuclear power plant d) Hydroelectric plant

11) Function of surge tank is to _____ _.

- a) Store water on load rejection
 - b) Furnish additional water during increased load demand
 - c) Both to store and supply water
 - d) None

Unit power of turbine is _____. 12)

- a) P/H^{3/2} P/H b) P/H^2 c) P/√H d)
- Pump storage scheme are used to improve _____. 13)
 - a) Load factor
 - b) Power factor
 - c) Plant capacity factor as well as load factor
 - d) Delivery factor
- 14) Cavitation in a turbine causes _____.
 - a) Low efficiency
 - b) Blade surface is damaged
 - c) Vibration and noise
 - d) None of the above

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from Section one (Que.no.2 to 4) and attempt any two questions from section two (Que. no. 5 to 7).

- 2) Figures to the right indicates full marks.
- 3) Draw neat labeled diagrams whenever necessary.
- 4) Use of only non programmable calculator is allowed.
- 5) Assume suitable data wherever necessary.

Section – I

Q.2	a)	What do you understand by non-conventional sources of power generation? What is the scope of these sources in India?	07
	b)	When a run of river plant operates as a peak load stations with a weekly load factor of 21%, all its capacity is firm capacity. What will be the minimum flow in the river so that the station may serve as the base load stations. It is given that, installed capacity of generator = 14,000 kW, Operating Head = 14 m, Plant efficiency = 82%, also estimate the daily load factor of the plant if the stream flow is 20 cumcs.	07
Q.3	a)	Define Hydrograph and explain its importance in the design of storage type hydro electric power plant.	05
	b)	Common load shared by two stations base load plant with 50 MW capacity	05

- b) Common load shared by two stations base load plant with 50 MW capacity **05** and other being standby plant with 55 MW capacity. The yearly output for base load station is 210×10^6 KWh and for standby station is 18×10^6 KWh. The peak load taken by standby station is 17 MW which works for 2424 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- c) What is a surge tank and are its functions? Describe different types of 04 surge tanks.
- Q.4 a) A penstock, with an internal diameter 1.25 m, supplies water at a head equivalent to 18.7 kg/cm². There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1020 kg/m² and 85% resp. Find the wall thickness of penstock.
 - b) What are the principal components of a 'Hydro-electric' scheme? Discuss
 04 the utility of each component.
 - c) What do you understand by 'Water Hammer' in pipe line? Derive an expression for the water hammer pressure in case of rigid pipe.

Max. Marks: 56



SLR-FM-39 Set Q

Section – II

Q.5	a)	The following data refers to a proposed hydroelectric power plant, available Head = 27 m, catchment area = 400 km^2 a Rainfall = 150 cm/yr , of total rain fall utilized = 7.5%, turbine efficiency 82%, penstock efficiency 85%, generator efficiency 86%, load factor 0.42, calculate the power that can be developed suggest suitable turbine for the plant.	07
	b)	What do you understand by 'pump storage plant'? What are the advantages and disadvantages of this power plant? Where can such schemes to be applied?	07
Q.6	a)	What do you understand by the term 'specific speed' of a turbine? What	04
	b)	A Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 71000 kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 %. The four units together will provide for a power of 348000 hp at a efficiency of 91 %. The nozzle efficiency is 0.98. Find:	06
	c)	 the design discharge for the turbine jet dia, and no. of jets the nozzle tip diameter the pitch circle dia. of the wheel the specific speed and number of buckets on the wheel Explain the function of Anchor block and enlist the forces acting on it? Draw a neat figure. 	04
Q.7	a)	In an estuary, which is being considered for possible tidal power generation during tidal cycle, the observed difference between high and low water of the tide was 5.0 m. It has been estimated this estuary having an area of 0.45 km ² can generate power of 3 hours in each cycle. Assuming the average available head to be 4.0 m and the overall efficiency of the generation to 77%. Calculate the power (hp) at any instant and the total energy in a year. Take Density of sea water as 1025kg/m ³ .	06
	b)	Describe how ocean tides are generated. With tidal cycle in view, describe how hydropower can be generated. Enumerate the limitations of tidal power generation	04
	c)	Explain the terms: 1) Draft tube	04

2) Trash rack

S

Civil Engineering WATER POWER ENGINEERING Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019

- 2) Draw neat labeled diagrams whenever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) Unit power of turbine is _____.
 - a) P/H^{3/2} b) P/H
 - c) P/\sqrt{H} d) P/H^2
 - 2) Pump storage scheme are used to improve _____.
 - a) Load factor
 - b) Power factor
 - c) Plant capacity factor as well as load factor
 - d) Delivery factor
 - 3) Cavitation in a turbine causes _____.
 - a) Low efficiency
 - b) Blade surface is damaged
 - c) Vibration and noise
 - d) None of the above
 - 4) The draft tube is provided to _____.
 - a) reduce the effect of water hammer
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above
 - 5) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called _____.
 - a) Penstock b) Spillways
 - c) Reservoir d) Fore bay
 - Jet ratio 'm' is defined as the ratio of _____
 - a) Diameter of jet of water to diameter of pelton wheel.
 - b) Velocity of vane to velocity of jet of water
 - c) Velocity of flow to velocity of jet of water
 - d) Diameter of pelton wheel to diameter of jet

Set R

Max. Marks: 70

SLR-FM-39

Marks: 14

Set 7) Water hammer' process in penstock result in . a) pressure decreases b) noise decreases c) noise increases, pressure increases, velocity decreases d) None 8) The load factor for the peak day of the year determines the required a) Water storage b) Pondage c) Generating capacity None d) 9) In Francis turbine runner, the number of blades is usually of the order of a) 16-24 12-14 b) 6-8 d) 3-6 C) Surge tank is necessarily provided 10) short length penstocks a) long penstocks b) c) surface penstocks d) embedded penstocks 11) The capacity of small hydro power plant are in order of _____. a) 20-5 MW 15-100 MW b) c) 1-15 MW d) 15-20 MW 12) Power plant having maximum demand more than the installed rated capacity will have utilization factor _ a) Equal to unity More than unity b) c) Less than unity d) None 13) Which plant can never have 100 percent load factor? Base load plant b) Peak load plant a) c) Nuclear power plant d) Hydroelectric plant Function of surge tank is to _____. 14) a) Store water on load rejection b) Furnish additional water during increased load demand c) Both to store and supply water

d) None

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from Section one (Que.no.2 to 4) and attempt any two questions from section two (Que. no. 5 to 7).

- 2) Figures to the right indicates full marks.
- 3) Draw neat labeled diagrams whenever necessary.
- 4) Use of only non programmable calculator is allowed.
- 5) Assume suitable data wherever necessary.

Section – I

Q.2	a)	What do you understand by non-conventional sources of power	07
		generation? What is the scope of these sources in India?	~-
	b)	When a run of river plant operates as a peak load stations with a weekly load factor of 21%, all its capacity is firm capacity. What will be the minimum flow in the river so that the station may serve as the base load stations. It is given that, installed capacity of generator = 14,000 kW, Operating Head = 14 m, Plant efficiency = 82%, also estimate the daily load factor of the plant if the stream flow is 20 cumcs.	07
Q.3	a)	Define Hydrograph and explain its importance in the design of storage type hydro electric power plant.	05
	b)	Common load shared by two stations base load plant with 50 MW capacity and other being standby plant with 55 MW capacity. The yearly output for	05

- and other being standby plant with 55 MW capacity. The yearly output for base load station is 210×10^{6} KWh and for standby station is 18×10^{6} KWh. The peak load taken by standby station is 17 MW which works for 2424 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- c) What is a surge tank and are its functions? Describe different types of 04 surge tanks.
- Q.4 a) A penstock, with an internal diameter 1.25 m, supplies water at a head equivalent to 18.7 kg/cm². There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1020 kg/m² and 85% resp. Find the wall thickness of penstock.
 - b) What are the principal components of a 'Hydro-electric' scheme? Discuss
 04 the utility of each component.
 - c) What do you understand by 'Water Hammer' in pipe line? Derive an expression for the water hammer pressure in case of rigid pipe.

Max. Marks: 56


SLR-FM-39 Set R

Section – II

Q.5	a)	The following data refers to a proposed hydroelectric power plant, available Head = 27 m, catchment area = 400 km ² a Rainfall = 150 cm/yr, of total rain fall utilized = 7.5%, turbine efficiency 82%, penstock efficiency 85%, generator efficiency 86%, load factor 0.42, calculate the power that can be developed suggest suitable turbine for the plant.	07
	b)	What do you understand by 'pump storage plant'? What are the advantages and disadvantages of this power plant? Where can such schemes to be applied?	07
Q.6	a)	What do you understand by the term 'specific speed' of a turbine? What	04
	b)	A Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 71000 kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 %. The four units together will provide for a power of 348000 hp at a efficiency of 91 %. The nozzle efficiency is 0.98.	06
	c)	 Find: the design discharge for the turbine jet dia, and no. of jets the nozzle tip diameter the pitch circle dia. of the wheel the specific speed and number of buckets on the wheel Explain the function of Anchor block and enlist the forces acting on it? Draw a neat figure. 	04
Q.7	a)	In an estuary, which is being considered for possible tidal power generation during tidal cycle, the observed difference between high and low water of the tide was 5.0 m. It has been estimated this estuary having an area of 0.45 km ² can generate power of 3 hours in each cycle. Assuming the average available head to be 4.0 m and the overall efficiency of the generation to 77%. Calculate the power (hp) at any instant and the total energy in a year. Take Density of sea water as 1025kg/m ³ .	06
	b)	Describe how ocean tides are generated. With tidal cycle in view, describe how hydropower can be generated. Enumerate the limitations of tidal power generation	04
	c)	Explain the terms: 1) Draft tube	04

2) Trash rack

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Draw neat labeled diagrams whenever necessary.
- 3) Use of only non programmable calculator is allowed.
- 4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) Jet ratio 'm' is defined as the ratio of _____.
 - a) Diameter of jet of water to diameter of pelton wheel.
 - b) Velocity of vane to velocity of jet of water
 - c) Velocity of flow to velocity of jet of water
 - d) Diameter of pelton wheel to diameter of jet

2) Water hammer' process in penstock result in _____.

- a) pressure decreases
- b) noise decreases
- c) noise increases, pressure increases, velocity decreases
- d) None

3) The load factor for the peak day of the year determines the required

a)	Water storage	b)	Pondage

- c) Generating capacity d) None
- 4) In Francis turbine runner, the number of blades is usually of the order of .
 - a) 16-24 b) 12-14
 - c) 6-8 d) 3-6

5) Surge tank is necessarily provided _____

- a) long penstocks b) short length penstocks
 - c) surface penstocks d) embedded penstocks
- 6) The capacity of small hydro power plant are in order of _____.
 - a) 20-5 MW b) 15-100 MW
 - c) 1-15 MW d) 15-20 MW

- a) Equal to unity b) More than unity
- c) Less than unity d) None

Set S

Max. Marks: 70

Marks: 14

14

⁷⁾ Power plant having maximum demand more than the installed rated capacity will have utilization factor _____.

- 8) Which plant can never have 100 percent load factor?
 - a) Base load plant

b) Peak load plant

SLR-FM-39

Set S

- c) Nuclear power plant
- d) Hydroelectric plant
- 9) Function of surge tank is to _____
 - a) Store water on load rejection
 - b) Furnish additional water during increased load demand
 - c) Both to store and supply water
 - d) None
- 10) Unit power of turbine is _____.
 - a) $P/H^{3/2}$ b) P/Hc) P/\sqrt{H} d) P/H^2
- 11) Pump storage scheme are used to improve _____.
 - a) Load factor
 - b) Power factor
 - c) Plant capacity factor as well as load factor
 - d) Delivery factor
- 12) Cavitation in a turbine causes _____.
 - a) Low efficiency
 - b) Blade surface is damaged
 - c) Vibration and noise
 - d) None of the above
- 13) The draft tube is provided to _____.
 - a) reduce the effect of water hammer
 - b) raise the water surface of the stream to create an artificial head
 - c) increase the acting head on the water wheel
 - d) none of the above
- 14) In hydro electric power station what is an enlarge body of water just above the intake and used as a regulating reservoir called _____.
 - a) Penstock b) Spillways
 - c) Reservoir d) Fore bay

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering WATER POWER ENGINEERING

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from Section one (Que.no.2 to 4) and attempt any two questions from section two (Que. no. 5 to 7).

- 2) Figures to the right indicates full marks.
- 3) Draw neat labeled diagrams whenever necessary.
- 4) Use of only non programmable calculator is allowed.
- 5) Assume suitable data wherever necessary.

Section – I

Q.2	a)	What do you understand by non-conventional sources of power	07
		generation? What is the scope of these sources in India?	
	b)	When a run of river plant operates as a peak load stations with a weekly load factor of 21%, all its capacity is firm capacity. What will be the minimum flow in the river so that the station may serve as the base load stations. It is given that, installed capacity of generator = 14,000 kW, Operating Head = 14 m, Plant efficiency = 82%, also estimate the daily load factor of the plant if the stream flow is 20 cumcs.	07
Q.3	a)	Define Hydrograph and explain its importance in the design of storage type hydro electric power plant.	05
	b)	Common load shared by two stations base load plant with 50 MW capacity	05

- **b)** Common load shared by two stations base load plant with 50 MW capacity **05** and other being standby plant with 55 MW capacity. The yearly output for base load station is 210×10^{6} KWh and for standby station is 18×10^{6} KWh. The peak load taken by standby station is 17 MW which works for 2424 hrs during the year. The base load station takes peak load as 32 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.
- c) What is a surge tank and are its functions? Describe different types of 04 surge tanks.
- Q.4 a) A penstock, with an internal diameter 1.25 m, supplies water at a head equivalent to 18.7 kg/cm². There is a possibility of 20% in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1020 kg/m² and 85% resp. Find the wall thickness of penstock.
 - b) What are the principal components of a 'Hydro-electric' scheme? Discuss
 04 the utility of each component.
 - c) What do you understand by 'Water Hammer' in pipe line? Derive an expression for the water hammer pressure in case of rigid pipe.

Max. Marks: 56

Set S

SLR-FM-39 Set S

Section – II

Q.5	a)	The following data refers to a proposed hydroelectric power plant, available Head = 27 m, catchment area = 400 km^2 a Rainfall = 150 cm/yr , of total rain fall utilized = 7.5%, turbine efficiency 82%, penstock efficiency 85%, generator efficiency 86%, load factor 0.42, calculate the power that can be developed suggest suitable turbine for the plant.	07
	b)	What do you understand by 'pump storage plant'? What are the advantages and disadvantages of this power plant? Where can such schemes to be applied?	07
Q.6	a)	What do you understand by the term 'specific speed' of a turbine? What information does it give and how it is made use in practice?	04
	b)	A Power house is equipped with 4 units of vertical shaft pelton turbines to be coupled with 71000 kVA, 3 phase. 50 hertz generation. The generation are provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 %. The four units together will provide for a power of 348000 hp at a efficiency of 91 %. The nozzle efficiency is 0.98. Find:	06
		 the design discharge for the turbine jet dia, and no. of jets the nozzle tip diameter the pitch circle dia. of the wheel the specific speed and 	
	c)	6) number of buckets on the wheel Explain the function of Anchor block and enlist the forces acting on it? Draw a neat figure.	04
Q.7	a)	In an estuary, which is being considered for possible tidal power generation during tidal cycle, the observed difference between high and low water of the tide was 5.0 m. It has been estimated this estuary having an area of 0.45 km ² can generate power of 3 hours in each cycle. Assuming the average available head to be 4.0 m and the overall efficiency of the generation to 77%. Calculate the power (hp) at any instant and the total energy in a year. Take Density of sea water as 1025kg/m ³ .	06
	b)	Describe how ocean tides are generated. With tidal cycle in view, describe how hydropower can be generated. Enumerate the limitations of tidal power generation	04
	c)	Explain the terms: 1) Draft tube	04

2) Trash rack

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ADVANCED CONCRETE TECHNOLOGY** Day & Date: Wednesday, 27-11-2019 Max. Marks: 70 book. Mention, Q.P. set (A/B/C/D) on the top of Page. 3) Figures to right indicate full marks. **MCQ/Objective Type Questions Duration: 30 Minutes** Q.1 Choose the correct alternatives from the options and rewrite the sentence. The specific surface area of cement is expressed in _ mm^2 mm²/gram a) b) gram/ mm² c) d) none of these The compaction factor test of cement concrete determines its _____. strength porosity a) b) c) workability d) flexural strength The ratio of tensile strength of concrete to compressive strength is _____. a) 1/10 b) 1/33 1/20 1/25 c) d)

- Water gain in cement concrete is defined as 4)
 - separation of coarser particles of mix causing non-homogeneity a)
 - appearance of water over surface of finished concrete b)
 - formation of capillary pores in fresh cement c)
 - none of these d)
- 5) A mixer designated as 400 NT indicates that
 - It is non tilting type mixer a)
 - mix batch capacity is 400 liter b)
 - c) both a & b
 - d) none of these

6) The cement-sand ratio in ferrocement matrix should not be leaner than _____.

- a) 1.1 b) 1.6
- c) 1.3 d) 1.4
- In ultrasonic pulse velocity test, poor quality of concrete is indicated if 7) pulse velocitv is
 - Below 2.5 km/s a)
- Between 3 to 3.5 km/s b) d) None of these
- c) Above 4.5 km/s
- Slump value of concrete is a measure of its 8) compressive strenght
 - consistency a) b)
 - tensile strenght impact value C) d)

Time: 10:00 AM To 01:00 PM

Seat

1)

2)

3)

No.

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

2) Answer MCQ/Objective type questions on Page No.3 only, Don't forget to

Marks: 14

14

Set

SLR-FM-40

				SLR-FM-	· 40
				Set	Ρ
9)	Fact a) c)	tors which affect workability are _ water content grading of aggregate	b) d)	shape and size of aggregate all of above	
10)	RM(a) c)	C stands for Rapid Mix Cement Ready Mix Cements	b) d)	Ready Mix Concrete Rapid Mix Concrete	
11)	Part a) c)	ticles of 0.002mm size are that of clay gravel	b) d)	 Sand none of these	
12)	Non a) c)	uniform compaction may cause t porous reduce strength	he co b) d)	ncrete non-homogeneous all of above	
13)	lf fin a) c)	eness modulus of sand is 2.7, it i very fine sand coarser sand	s grac b) d)	ded as medium sand all of above	
14)	lf slu a) c)	ump value is 75mm its workability very high medium	is b) d)	High all of above	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Q no.2,3,4 and 7,8,9.

- 2) Q. NO. 5 and 6 are compulsory.
- 3) Figures to right indicate full marks.
- 4) Use of non-programmable calculators allowed.
- 5) Assume suitable data if necessary and mention it clearly.

Section - I

- Q.2 Give brief classification of course aggregate. Write short note on recycled 09 aggregate. Q.3 Write short note chemical admixture and explain their effect on the properties 09 of concrete. Q.4 Explain in detail Roller Compacted Concrete and Radiation Shielding Concrete 09 Define Durability and Carbonation of concrete. Explain factors which affect Q.5 10 durability of concrete in detail. Section –II Q.6 What are the particular requirements for pumpability of a concrete mix? 10
- Q.7 What are the special precautions to be adopted on the site for efficiently using ready mixed concrete? Explain in detail.
- Q.8 What is Mix Design? Write down design steps of concrete mix design using IS 09 10262:2009 method.
- **Q.9** What are the factors contributing cracks in concrete? Explain any crack repair **09** technique in detail.

SLR-FM-40

Max. Marks: 56

Set P

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ADVANCED CONCRETE TECHNOLOGY** Day & Date: Wednesday, 27-11-2019 Max. Marks: 70 Time: 10:00 AM To 01:00 PM Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Answer MCQ/Objective type questions on Page No.3 only, Don't forget to Mention, Q.P. set (A/B/C/D) on the top of Page.

b)

d)

Ready Mix Concrete

Rapid Mix Concrete

3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Slump value of concrete is a measure of its 1)
- consistency compressive strenght a) b) tensile strenght d) impact value c)
- Factors which affect workability are _____. 2) shape and size of aggregate water content b) a)
 - grading of aggregate c) d) all of above

RMC stands for 3)

Duration: 30 Minutes

C)

a)

Seat

No.

- a) Rapid Mix Cement
- Ready Mix Cements c)
- 4) Particles of 0.002mm size are that of
 - b) Sand clay a) C)
 - gravel d) none of these
- 5) Non uniform compaction may cause the concrete .
 - non-homogeneous a) porous b)
 - reduce strength all of above c) d)

6) If fineness modulus of sand is 2.7, it is graded as _

- very fine sand b) medium sand a) coarser sand all of above c) d)
- If slump value is 75mm its workability is 7) very high High a) b)
 - medium d) all of above

The specific surface area of cement is expressed in _ 8)

- mm^2 mm²/gram a) b) gram/ mm² d) none of these C)
- The compaction factor test of cement concrete determines its _____. 9)
 - strenath b) porositv
 - workability d) flexural strength C)
- The ratio of tensile strength of concrete to compressive strength is _____. 10)
 - 1/10 1/33 a) b) 1/25 c)
 - 1/20 d)

SLR-FM-40

Set Q

Marks: 14

- 11) Water gain in cement concrete is defined as _____.
 - separation of coarser particles of mix causing non-homogeneity a)
 - appearance of water over surface of finished concrete b)
 - formation of capillary pores in fresh cement C)
 - none of these d)
- 12) A mixer designated as 400 NT indicates that _____.
 - It is non tilting type mixer a)
 - mix batch capacity is 400 liter b)
 - both a & b C)
 - none of these d)
- 13) The cement-sand ratio in ferrocement matrix should not be leaner than _____.
 - 1.1 a) b) 1.6 c)
 - d) 1.3 1.4
- 14) In ultrasonic pulse velocity test, poor quality of concrete is indicated if pulse velocity is _.
 - Below 2.5 km/s a)

b) Between 3 to 3.5 km/s

SLR-FM-40

Set Q

C) Above 4.5 km/s d) None of these

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Solve any two questions from Q no.2,3,4 and 7,8,9.

- 2) Q. NO. 5 and 6 are compulsory.
- 3) Figures to right indicate full marks.
- 4) Use of non-programmable calculators allowed.
- 5) Assume suitable data if necessary and mention it clearly.

Section - I

- Q.2 Give brief classification of course aggregate. Write short note on recycled 09 aggregate. Q.3 Write short note chemical admixture and explain their effect on the properties 09 of concrete. Q.4 Explain in detail Roller Compacted Concrete and Radiation Shielding Concrete 09 Define Durability and Carbonation of concrete. Explain factors which affect Q.5 10 durability of concrete in detail. Section –II Q.6 What are the particular requirements for pumpability of a concrete mix? 10
- Q.7 What are the special precautions to be adopted on the site for efficiently using 09 ready mixed concrete? Explain in detail.
- What is Mix Design? Write down design steps of concrete mix design using IS **Q.8** 09 10262:2009 method.
- 09 Q.9 What are the factors contributing cracks in concrete? Explain any crack repair technique in detail.

Set

Max. Marks: 56

SLR-FM-40



SL	. R-	FN	1-40
----	-------------	----	------

Set | R

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions:1)	Q. No. 1 is compulsory and should be solved in first 30 minutes in answer
	book.

- 2) Answer MCQ/Objective type questions on Page No.3 only, Don't forget to Mention, Q.P. set (A/B/C/D) on the top of Page.
- 3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

6)

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- A mixer designated as 400 NT indicates that _____. 1)
 - It is non tilting type mixer a)
 - mix batch capacity is 400 liter b)
 - both a & b c)
 - none of these d)
- 2) The cement-sand ratio in ferrocement matrix should not be leaner than .
 - 1.6 a) 1.1 b) C) 1.3
 - d) 1.4
- 3) In ultrasonic pulse velocity test, poor quality of concrete is indicated if pulse velocity is
 - Below 2.5 km/s b) Between 3 to 3.5 km/s a) c) Above 4.5 km/s
 - d) None of these

Slump value of concrete is a measure of its _ 4)

- consistency compressive strenght a) b)
- c) tensile strenght d) impact value
- Factors which affect workability are _ 5) water content b) a)
 - shape and size of aggregate all of above grading of aggregate d) c)
 - RMC stands for Rapid Mix Cement b) Ready Mix Concrete a) Rapid Mix Concrete Ready Mix Cements C) d)
- 7) Particles of 0.002mm size are that of Sand
 - a) clay b) gravel none of these C) d)
- 8) Non uniform compaction may cause the concrete _____.
 - a) porous non-homogeneous b)
 - reduce strength all of above C) d)

If fineness modulus of sand is 2.7, it is graded as _____ 9)

- very fine sand a) medium sand b) coarser sand d) all of above C)
- 10) If slump value is 75mm its workability is _
 - very high High a) b) medium c) d) all of above

Page 7 of 12

Max. Marks: 70

			SLR-FM-	40
			Set	R
11)	The specific surface area of c a) mm ² c) gram/ mm ²	cement is expi b) d)	ressed in mm²/gram none of these	
12)	The compaction factor test of a) strength c) workability	cement conc b) d)	rete determines its porosity flexural strength	
13)	The ratio of tensile strength o a) 1/10 c) 1/20	of concrete to o b) d)	compressive strength is 1/33 1/25	
1/1)	Water gain in coment concret	to is defined a		

- 14) Water gain in cement concrete is defined as _____.a) separation of coarser particles of mix causing non-homogeneity
 - b) appearance of water over surface of finished concrete
 - c) formation of capillary pores in fresh cement
 - d) none of these

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Solve any two questions from Q no.2,3,4 and 7,8,9.

- 2) Q. NO. 5 and 6 are compulsory.
- 3) Figures to right indicate full marks.
- 4) Use of non-programmable calculators allowed.
- 5) Assume suitable data if necessary and mention it clearly.

Section - I

- Q.2 Give brief classification of course aggregate. Write short note on recycled 09 aggregate. Q.3 Write short note chemical admixture and explain their effect on the properties 09 of concrete. Q.4 Explain in detail Roller Compacted Concrete and Radiation Shielding Concrete 09 Define Durability and Carbonation of concrete. Explain factors which affect Q.5 10 durability of concrete in detail. Section –II Q.6 What are the particular requirements for pumpability of a concrete mix? 10 What are the special precautions to be adopted on the site for efficiently using Q.7 09
- ready mixed concrete? Explain in detail. What is Mix Design? Write down design steps of concrete mix design using IS **Q.8** 09
- 10262:2009 method.
- 09 Q.9 What are the factors contributing cracks in concrete? Explain any crack repair technique in detail.

Max. Marks: 56

Set R

SLR-FM-40

Seat	
No.	

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

- **Instructions:**1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Answer MCQ/Objective type questions on Page No.3 only, Don't forget to Mention, Q.P. set (A/B/C/D) on the top of Page. 3) Figures to right indicate full marks. **MCQ/Objective Type Questions Duration: 30 Minutes** Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 RMC stands for 1) Rapid Mix Cement Ready Mix Concrete a) b) Ready Mix Cements Rapid Mix Concrete c) d)
 - 2) Particles of 0.002mm size are that of
 - b) Sand a) clay c) gravel d) none of these

Non uniform compaction may cause the concrete _ 3)

- a) porous b) non-homogeneous all of above
- reduce strength c) d)

If fineness modulus of sand is 2.7, it is graded as 4)

- very fine sand medium sand a) b)
- coarser sand all of above C) d)
- 5) If slump value is 75mm its workability is very high a) b) High c) medium all of above d)
- 6) The specific surface area of cement is expressed in
 - mm^2 mm²/gram a) b)
 - gram/ mm² none of these c) d)

The compaction factor test of cement concrete determines its . 7)

- strength porosity a) b) C)
 - workability d) flexural strength

The ratio of tensile strength of concrete to compressive strength is _____. 8)

- a) 1/10 b) 1/33
- 1/25 1/20 d) C)
- Water gain in cement concrete is defined as ____ 9)
 - separation of coarser particles of mix causing non-homogeneity a)
 - b) appearance of water over surface of finished concrete
 - formation of capillary pores in fresh cement C)
 - d) none of these



Max. Marks: 70



- 10) A mixer designated as 400 NT indicates that _____.
 - a) It is non tilting type mixer
 - b) mix batch capacity is 400 liter
 - c) both a & b

a)

a) c)

d) none of these

11) The cement-sand ratio in ferrocement matrix should not be leaner than _____.

- a) 1.1 b) 1.6
- c) 1.3 d) 1.4
- 12) In ultrasonic pulse velocity test, poor quality of concrete is indicated if pulse velocity is _____.
 - Below 2.5 km/s b) Between 3 to 3.5 km/s
 - c) Above 4.5 km/s d) None of these
- 13) Slump value of concrete is a measure of its _____.
 - consistency
- b) compressive strenght
- tensile strenght
- d) impact value
- 14) Factors which affect workability are _____.
 - a) water content
 - c) grading of aggregate
- b) shape and size of aggregate
- d) all of above

T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

ADVANCED CONCRETE TECHNOLOGY

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Solve any two questions from Q no.2,3,4 and 7,8,9.

- 2) Q. NO. 5 and 6 are compulsory.
- 3) Figures to right indicate full marks.
- 4) Use of non-programmable calculators allowed.
- 5) Assume suitable data if necessary and mention it clearly.

Section - I

- Q.2 Give brief classification of course aggregate. Write short note on recycled 09 aggregate. Q.3 Write short note chemical admixture and explain their effect on the properties 09 of concrete. Q.4 Explain in detail Roller Compacted Concrete and Radiation Shielding Concrete 09 Define Durability and Carbonation of concrete. Explain factors which affect Q.5 10 durability of concrete in detail. Section –II Q.6 What are the particular requirements for pumpability of a concrete mix? 10
- Q.7 What are the special precautions to be adopted on the site for efficiently using 09 ready mixed concrete? Explain in detail.
- Q.8 What is Mix Design? Write down design steps of concrete mix design using IS 09 10262:2009 method.
- **Q.9** What are the factors contributing cracks in concrete? Explain any crack repair **09** technique in detail.

Set S

SLR-FM-40

Max. Marks: 56

Page 1 of 20

SLR-FM-44

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

OPTIMIZATION TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book pages No.3. Each question carries one marks.

2) Answer MCQ/Objective type questions on page No.3 only. Don't forget to Mention, Q.P. Set (P/Q/R/S) on Top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
- A) A person is in the business of buying and selling items. He has 10 units in stock and plans for the next three periods. He can buy the item at the rate of Rs 50, 55 and 58 at the beginning of periods 1, 2 and 3 and can sell them at Rs 60, 64 and 66 at the end of the three periods. He can use the money earned by selling at the end of the period to buy items at the beginning of the next period. He can buy a maximum of 200 per period. He can borrow money at the rate of 2% per period at the beginning of each period. He can borrow a maximum of Rs 8000 per period and he cannot borrow more than Rs 20000 in total. He has to pay back all the loans with interest at the end of the third period.

(for sub questions 1 to 3)

- What is the correct objective function for this problem? 1)
 - Maximize the total money available at the end of the third period a)
 - Maximize the total money at the end of the third period less total money b) borrowed
 - Maximize the total money at the end of the third period less total money C) paid back including interest
 - Maximize the number of items sold at the end of the third period d)
- 2) How many decision variables are in the formulation?
 - 3 a) b) 6 9 10 c) d)
- 3) How many constraints (except non-negativity constraints) are in the formulation?
 - a) 6
 - c) 12



Max. Marks: 70

9

13

b) d)

Set

- B) A food stall sells idlis, dosas and poories. A plate of idli has 2 pieces, a plate of dosa has 1 piece while a plate of poori has 2 pieces. They also sell a "combo" which has 2 idlis and 2 poories. A kg of batter costs Rs 60 and twelve spoons of batter. Each piece of idli requires 1 spoon of batter and each dosa requires 1.5 spoons of batter. Each poori piece requires 1 ball of wheat dough and a kg of wheat dough that costs Rs 60 can make 20 balls of dough. The selling prices of the items are Rs 40, 60, 60 and 90 per plate respectively. The owner has Rs 800 with her and estimates the demand for the four items (in plates) as 50, 30, 20 and 10 respectively. There is a penalty cost of Rs 10 for any unmet plate of demand of an item. Idli being the most commonly consumed item, the owner wishes to meet at least 80% of the demand. Formulate an LP problem and answer the following questions: (for sub questions 4 to 6)
 - 4) What is the most suitable objective function for this problem?
 - Maximize the total money earned by sale a)
 - Maximize the total money earned by sale less the cost of items bought b)
 - Maximize the total plates made of all the items c)
 - Minimize the unmet demand d)
 - 5) How many decision variables are in the formulation?
 - a) 3 b) 4 5 d) 8 c)
 - How many constraints (except non-negativity constraints) are in the 6) formulation?
 - a) 3 b) 4
 - d) 6 c) 5
- C) If primal is maximize $40 X_1 + 35 X_2$, subjected to $2 X_1 + 3 X_2 \le 60$ and 7) $4 X_1 + 3 X_2 \le 96$, X_1 , $X_2 \ge 0$ the dual will have objective function as _____.
 - a) $3y_1 + 3y_2$ (minimize) $3y_1 - 3y_2$ (maximize) b)
 - c) $60y_1 + 96y_2$ (minimize) d) $60y_1 + 96y_2$ (maximize)
 - 8) The necessary condition for single variable unconstrained optimization problem is
 - $\mathrm{f}^1(\mathrm{x}^*) \neq 0$ a) $f^1(x^*) = 0$ b)
 - $f^1(x^*) > 0$ c) $f^1(x^*) < 0$ d)
 - If f(x) has only one variable useful, the second derivative $d^2f / (dx^2)$ is 9) positive for its _
 - Maximum values b) Minimum values a)
 - Minimax d) Maxmin c)
 - In an LPP; Max 5x + 6y. Subject to $2x + 3y \ge 50$, $4x + 3y \ge 100$, the 10) objective function of first phase in 2-phase method is a) 5x + 6y
 - $+5x + 6y MA_1 MA_2$ b)
 - c) $+A_1 + A_2$ d) $0x + oy - A_1 - A_2$
 - One of the important reason for carrying inventory is to _ 11)
 - a) Improve customer service b) Get quantity discount
 - c) Maintain operational capability All of the above d)

12) A type of decision-making environment is Uncertainty

- a) Certainty b)
- Risk d) All of the above c)





- 13) The size of the payoff matrix of a game can be reduced by using the principle of _____.
 - a) Game inversion

b) Rotation Reduction

c) Dominance

- d) Game transpose
- 14) A situation in which a decision maker knows all of the possible outcomes of a decision and also knows the probability associated with each outcome is referred to as _____.
 - a) Certainty
 - c) Risk

- b) Uncertainty
- d) Strategy

Page 4 of 20

SLR-FM-44

Set

Max. Marks: 56

Ρ

Seat	
No.	

 $x_1, x_2, x_3 \ge 0$

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory.

- 2) Solve any two out of 3, 4, 5.
- 3) Question No. 6 is compulsory.
- 4) Solve any two out of 7, 8, 9.
- 5) Assume suitable data whenever required.
- 6) Use of non-programmable calculator is allowed

Section – I

Q.2	a)	Analyze the function $f(x) = 12x^5 - 45x^4 + 45x^3 + 5$ and classify the	08
	b)	Stationary points as maxima, minima and points of milection. Write dual for following Primal Maximize $z = 4x_1 + 3x_2$ Subject to $x_1 + (2/3)x_2 \le 6000$ $x_1 - x_2 \ge 2000$ $x_1 \le 4000$ x_1 unrestricted $x_2 \ge 0$	04
Q.3	$\begin{array}{l} \text{Min}\\ \text{S.T.}\\ x_2 \leq \\ 3x_1\\ x_1, x\\ Income$	imize $z = 3x_1 + 5x_2$ $x_1 + x_2 \ge 2$ ≤ 6 $+ 2x_2 = 18$ $x_2 \ge 0$ proprote artificial variables and transform the LP problem.	08
Q.4	Solv Max ST 2 x ₁ - 5x ₁	ve using Simplex method kimize $z = 4x_1 - x_2 + 2x_3$ $2x_1 + x_2 + 2x_3 \le 6$ $-4x_2 + 2x_3 \le 0$ $-2x_2 - 2x_3 \le 4$	08



Q.5 Consider three factories (F) located in three different cities, producing a particular chemical. The chemical is to be transported to four different warehouses (Wh), from where it is supplied to the customers. The transportation cost per truck load from each factory to each warehouse is determined and are given in the table below. Production and demands are also given in the table below.

	Wh 1	Wh 2	Wh 3	Wh 4	Production
F1	523	682	458	850	60
F2	420	412	362	729	110
F3	670	558	895	695	150
Demand	65	85	80	70	

Find Minimum cost of transportation.

Section – II

- **Q.6 a)** What is decision under uncertainty? Explain With example.
 - **b)** Find the value of game graphically.

Player B
Player A
$$\begin{vmatrix} 3 & -3 & 4 \\ -1 & 1 & -3 \end{vmatrix}$$

- Q.7 A stockist purchases an item at the rate of Rs. 40 per piece from a manufacture.
 2000 units of the items are required per year. What should be the order quantity per order if the cost per order is Rs. 15 and the inventory charges per year are 20 paise.
- **Q.8** Using Branch & bound method solve following integer programming problem. **08** Maximize $z = 7x_1 + 9x_2$

S. to. $-x_1 + 3x_2 \le 6$ $7x_1 + x_2 \le 35$ $(0 \le x_1, x_2 \le 7)$ and x_1, x_2 are integers.

Q.9 Write note. (Any two)

- a) Economic Order Quantity
- b) Dynamic Programming
- c) Artificial Neural Network (ANN)

08

04

80

Seat

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering OPTIMIZATION TECHNIQUES**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book pages No.3. Each question carries one marks.
 - 2) Answer MCQ/Objective type questions on page No.3 only. Don't forget to Mention, Q.P. Set (P/Q/R/S) on Top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes

No.

- Marks: 14
- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
- A) A person is in the business of buying and selling items. He has 10 units in stock and plans for the next three periods. He can buy the item at the rate of Rs 50, 55 and 58 at the beginning of periods 1, 2 and 3 and can sell them at Rs 60, 64 and 66 at the end of the three periods. He can use the money earned by selling at the end of the period to buy items at the beginning of the next period. He can buy a maximum of 200 per period. He can borrow money at the rate of 2% per period at the beginning of each period. He can borrow a maximum of Rs 8000 per period and he cannot borrow more than Rs 20000 in total. He has to pay back all the loans with interest at the end of the third period.
 - (for sub questions 1 to 3)
 - 1) How many decision variables are in the formulation?
 - a) 3 b) 6 9 d) 10 c)
 - 2) How many constraints (except non-negativity constraints) are in the formulation?

a)	6	b)	9	
C)	12	d)	1	3

- 3) What is the correct objective function for this problem?
 - a) Maximize the total money available at the end of the third period
 - b) Maximize the total money at the end of the third period less total money borrowed
 - Maximize the total money at the end of the third period less total money c) paid back including interest
 - d) Maximize the number of items sold at the end of the third period

Max. Marks: 70

Set

Set

- B) A food stall sells idlis, dosas and poories. A plate of idli has 2 pieces, a plate of dosa has 1 piece while a plate of poori has 2 pieces. They also sell a "combo" which has 2 idlis and 2 poories. A kg of batter costs Rs 60 and twelve spoons of batter. Each piece of idli requires 1 spoon of batter and each dosa requires 1.5 spoons of batter. Each poori piece requires 1 ball of wheat dough and a kg of wheat dough that costs Rs 60 can make 20 balls of dough. The selling prices of the items are Rs 40, 60, 60 and 90 per plate respectively. The owner has Rs 800 with her and estimates the demand for the four items (in plates) as 50, 30, 20 and 10 respectively. There is a penalty cost of Rs 10 for any unmet plate of demand of an item. Idli being the most commonly consumed item, the owner wishes to meet at least 80% of the demand. Formulate an LP problem and answer the following questions: (for sub questions 4 to 6)
 - 4) How many decision variables are in the formulation?

a)	3	b) 4
C)	5	d) 8

5) How many constraints (except non-negativity constraints) are in the formulation?

a)	3	b)	4
c)	5	d)	6

- 6) What is the most suitable objective function for this problem?
 - a) Maximize the total money earned by sale
 - b) Maximize the total money earned by sale less the cost of items bought
 - c) Maximize the total plates made of all the items
 - d) Minimize the unmet demand

C) One of the important reason for carrying inventory is to 7)

- a) Improve customer service Get quantity discount b)
- All of the above c) Maintain operational capability d)
- A type of decision-making environment is 8)
 - a) Certainty Uncertainty b)
 - c) Risk d) All of the above
- 9) The size of the payoff matrix of a game can be reduced by using the principle of
 - a) Game inversion **Rotation Reduction** b)
 - c) Dominance d) Game transpose
- A situation in which a decision maker knows all of the possible outcomes 10) of a decision and also knows the probability associated with each outcome is referred to as _____.
 - b) Uncertainty Certainty a)
 - c) Risk d) Strategy
- 11) If primal is maximize $40 X_1 + 35 X_2$, subjected to $2 X_1 + 3 X_2 \le 60$ and $4 X_1 + 3 X_2 \le 96$, $X_1, X_2 \ge 0$ the dual will have objective function as _____.
 - a) $3y_1 + 3y_2$ (minimize)
- b) $3y_1 - 3y_2$ (maximize)
- c) $60y_1 + 96y_2$ (minimize) $60y_1 + 96y_2$ (maximize) d)
- The necessary condition for single variable unconstrained optimization 12) problem is $f^1(x^*) \neq 0$

b)

- a) $f^1(x^*) = 0$
- $f^1(x^*) > 0$ c) $f^1(x^*) < 0$ d)

Set Q

- If f(x) has only one variable useful, the second derivative $d^2f/(dx^2)$ is 13) positive for its _____.
 - a) Maximum values
- b) Minimum values

c) Minimax

- d) Maxmin
- 14) In an LPP; Max 5x + 6y. Subject to $2x + 3y \ge 50$, $4x + 3y \ge 100$, the objective function of first phase in 2-phase method is _____.
 - a) 5x + 6y

+5x + 6y - MA₁ - MA₂ b)

c) $+A_1 + A_2$

 $0x + oy - A_1 - A_2$ d)

Page **9** of **20**

SLR-FM-44

Set

Q

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering OPTIMIZATION TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory.

- 2) Solve any two out of 3, 4, 5.
- 3) Question No. 6 is compulsory.
- 4) Solve any two out of 7, 8, 9.
- 5) Assume suitable data whenever required.
- 6) Use of non-programmable calculator is allowed

Section – I

Q.2	a) Analyze the function $f(x) = 12x^5 - 45x^4 + 45x^3 + 5$ and classify the stationary points as maximal minima and points of inflection				
	b)	Stationary points as maxima, minima and points of milection. Write dual for following Primal Maximize $z = 4x_1 + 3x_2$ Subject to $x_1 + (2/3)x_2 \le 6000$ $x_1 - x_2 \ge 2000$ $x_1 \le 4000$ x_1 unrestricted $x_2 \ge 0$	04		
Q.3	$\begin{array}{l} \text{Min} \\ \text{S.T.} \\ x_2 \leq \\ 3x_1 \\ x_1, x \\ Income$	imize $z = 3x_1 + 5x_2$ $x_1 + x_2 \ge 2$ ≤ 6 $+ 2x_2 = 18$ $x_2 \ge 0$ proprote artificial variables and transform the LP problem.	08		
Q.4	Solv Max ST 2 x ₁ -	ve using Simplex method kimize $z = 4x_1 - x_2 + 2x_3$ $2x_1 + x_2 + 2x_3 \le 6$ $-4x_2 + 2x_3 \le 0$ $-2x_1 - 2x_2 \le 4$	08		

$$5x_1 - 2x_2 - 2x_3 \le 4 x_1, x_2, x_3 \ge 0$$

Max. Marks: 56



04

80

Q.5 Consider three factories (F) located in three different cities, producing a particular chemical. The chemical is to be transported to four different warehouses (Wh), from where it is supplied to the customers. The transportation cost per truck load from each factory to each warehouse is determined and are given in the table below. Production and demands are also given in the table below.

	Wh 1	Wh 2	Wh 3	Wh 4	Production
F1	523	682	458	850	60
F2	420	412	362	729	110
F3	670	558	895	695	150
Demand	65	85	80	70	

Find Minimum cost of transportation.

Section – II

- **Q.6 a)** What is decision under uncertainty? Explain With example.
 - **b)** Find the value of game graphically.

Player B
Player A
$$\begin{vmatrix} 3 & -3 & 4 \\ -1 & 1 & -3 \end{vmatrix}$$

- Q.7 A stockist purchases an item at the rate of Rs. 40 per piece from a manufacture.
 2000 units of the items are required per year. What should be the order quantity per order if the cost per order is Rs. 15 and the inventory charges per year are 20 paise.
- **Q.8** Using Branch & bound method solve following integer programming problem. **08** Maximize $z = 7x_1 + 9x_2$

S. to. $-x_1 + 3x_2 \le 6$ $7x_1 + x_2 \le 35$ $(0 \le x_1, x_2 \le 7)$ and x_1, x_2 are integers.

Q.9 Write note. (Any two)

- a) Economic Order Quantity
- b) Dynamic Programming
- c) Artificial Neural Network (ANN)

08

Seat

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering OPTIMIZATION TECHNIQUES**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book pages No.3. Each question carries one marks.
 - 2) Answer MCQ/Objective type questions on page No.3 only. Don't forget to Mention, Q.P. Set (P/Q/R/S) on Top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes

No.

- Marks: 14
- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
- A) A person is in the business of buying and selling items. He has 10 units in stock and plans for the next three periods. He can buy the item at the rate of Rs 50, 55 and 58 at the beginning of periods 1, 2 and 3 and can sell them at Rs 60, 64 and 66 at the end of the three periods. He can use the money earned by selling at the end of the period to buy items at the beginning of the next period. He can buy a maximum of 200 per period. He can borrow money at the rate of 2% per period at the beginning of each period. He can borrow a maximum of Rs 8000 per period and he cannot borrow more than Rs 20000 in total. He has to pay back all the loans with interest at the end of the third period.
 - (for sub questions 1 to 3)
 - 1) How many constraints (except non-negativity constraints) are in the formulation?
 - a) 6 b) 9
 - 13 c) 12 d)
 - 2) How many decision variables are in the formulation?

a)	3	b)	6
c)	9	d)	10

- 3) What is the correct objective function for this problem?
 - a) Maximize the total money available at the end of the third period
 - b) Maximize the total money at the end of the third period less total money borrowed
 - Maximize the total money at the end of the third period less total money C) paid back including interest
 - d) Maximize the number of items sold at the end of the third period

Max. Marks: 70

Set

Set

- B) A food stall sells idlis, dosas and poories. A plate of idli has 2 pieces, a plate of dosa has 1 piece while a plate of poori has 2 pieces. They also sell a "combo" which has 2 idlis and 2 poories. A kg of batter costs Rs 60 and twelve spoons of batter. Each piece of idli requires 1 spoon of batter and each dosa requires 1.5 spoons of batter. Each poori piece requires 1 ball of wheat dough and a kg of wheat dough that costs Rs 60 can make 20 balls of dough. The selling prices of the items are Rs 40, 60, 60 and 90 per plate respectively. The owner has Rs 800 with her and estimates the demand for the four items (in plates) as 50, 30, 20 and 10 respectively. There is a penalty cost of Rs 10 for any unmet plate of demand of an item. Idli being the most commonly consumed item, the owner wishes to meet at least 80% of the demand. Formulate an LP problem and answer the following questions: (for sub questions 4 to 6)
 - 4) How many constraints (except non-negativity constraints) are in the formulation?
 - a) 3 b) 4
 - 5 d) 6 c)
 - 5) How many decision variables are in the formulation?
 - a) 3 b) 4
 - c) 5 d) 8
 - What is the most suitable objective function for this problem? 6)
 - a) Maximize the total money earned by sale
 - b) Maximize the total money earned by sale less the cost of items bought
 - Maximize the total plates made of all the items C)
 - d) Minimize the unmet demand

If f(x) has only one variable useful, the second derivative $d^2f / (dx^2)$ is C) 7) positive for its .

- a) Maximum values
- Minimum values b)
- c) Minimax d) Maxmin
- In an LPP; Max 5x + 6y. Subject to $2x + 3y \ge 50$, $4x + 3y \ge 100$, the 8) objective function of first phase in 2-phase method is .
 - a) 5x + 6y
- b) +5x + 6y - MA₁ - MA₂
- c) $+A_1 + A_2$ d) $0x + oy - A_1 - A_2$
- 9) One of the important reason for carrying inventory is to a) Improve customer service
 - Get quantity discount b)
 - c) Maintain operational capability All of the above d)

10) A type of decision-making environment is _

- Uncertainty a) Certainty b) Risk c)
 - d) All of the above
- 11) The size of the payoff matrix of a game can be reduced by using the principle of
 - a) Game inversion b) Rotation Reduction
 - Dominance d) Game transpose c)
- A situation in which a decision maker knows all of the possible outcomes 12) of a decision and also knows the probability associated with each outcome is referred to as
 - a) Certainty

c)

Risk

b) Uncertainty d) Strategy



If primal is maximize $40 X_1 + 35 X_2$, subjected to $2 X_1 + 3 X_2 \le 60$ and 13) 4 X_1 + 3 $X_2 \le 96$, X_1 , $X_2 \ge 0$ the dual will have objective function as _____ a) 3 y_1 + 3 y_2 (minimize) b) 3 y_1 - 3 y_2 (maximize) ___·

d)

- c) $60y_1 + 96y_2$ (minimize)
- $60y_1 + 96y_2$ (maximize)
- The necessary condition for single variable unconstrained optimization 14) problem is _____.

a)
$$f^1(x^*) = 0$$
 b) $f^1(x^*) \neq$

b) $f^1(x^*) \neq 0$ d) $f^1(x^*) > 0$ c) $f^1(x^*) < 0$

		;	SLR-FM	-44
Seat No.	t		Set	R
		T.E. (Part – II) (New) (CBCS) Examination Nov/Dec- Civil Engineering OPTIMIZATION TECHNIQUES	2019	
Day & Time	& Dat : 10:0	te: Wednesday, 27-11-2019 00 AM To 01:00 PM	Max. Mark	s: 56
Instr	uctio	 ans: 1) Question No. 2 is compulsory. 2) Solve any two out of 3, 4, 5. 3) Question No. 6 is compulsory. 4) Solve any two out of 7, 8, 9. 5) Assume suitable data whenever required. 6) Use of non-programmable calculator is allowed 		
		Section – I		
Q.2	a)	Analyze the function $f(x) = 12x^5 - 45x^4 + 45x^3 + 5$ and classify stationary points as maximal minima and points of inflection	the	08
	b)	Write dual for following Primal		04
		Maximize $z = 4x_1 + 3x_2$ Subject to $x_1 + (2/3)x_2 \le 6000$ $x_1 - x_2 \ge 2000$ $x_1 \le 4000$ x_1 unrestricted $x_2 \ge 0$		
Q.3	Min s t	$imize z = 3x_1 + 5x_2$		08
	$x_2 \le 3x_1 \\ x_1, x_2 \le 3x_1$	$x_1 + x_2 \ge 2$ $x_2 = 6$ $x_1 + 2x_2 = 18$ $x_2 \ge 0$ orporate artificial variables and transform the LP problem.		
Q.4	Solv Max ST 2 x ₁ - 5x ₁ x ₁ , 2	we using Simplex method timize $z = 4x_1 - x_2 + 2x_3$ $x_1 + x_2 + 2x_3 \le 6$ $-4x_2 + 2x_3 \le 0$ $-2x_2 - 2x_3 \le 4$ $x_2, x_3 \ge 0$		08

Set



04

80

Q.5 Consider three factories (F) located in three different cities, producing a particular chemical. The chemical is to be transported to four different warehouses (Wh), from where it is supplied to the customers. The transportation cost per truck load from each factory to each warehouse is determined and are given in the table below. Production and demands are also given in the table below.

	Wh 1	Wh 2	Wh 3	Wh 4	Production
F1	523	682	458	850	60
F2	420	412	362	729	110
F3	670	558	895	695	150
Demand	65	85	80	70	

Find Minimum cost of transportation.

Section – II

- **Q.6 a)** What is decision under uncertainty? Explain With example.
 - **b)** Find the value of game graphically.

Player B
Player A
$$\begin{vmatrix} 3 & -3 & 4 \\ -1 & 1 & -3 \end{vmatrix}$$

- Q.7 A stockist purchases an item at the rate of Rs. 40 per piece from a manufacture.
 2000 units of the items are required per year. What should be the order quantity per order if the cost per order is Rs. 15 and the inventory charges per year are 20 paise.
- **Q.8** Using Branch & bound method solve following integer programming problem. **08** Maximize $z = 7x_1 + 9x_2$

S. to. $-x_1 + 3x_2 \le 6$ $7x_1 + x_2 \le 35$ $(0 \le x_1, x_2 \le 7)$ and x_1, x_2 are integers.

Q.9 Write note. (Any two)

- a) Economic Order Quantity
- b) Dynamic Programming
- c) Artificial Neural Network (ANN)

08

Seat

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering OPTIMIZATION TECHNIQUES**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book pages No.3. Each question carries one marks.

2) Answer MCQ/Objective type questions on page No.3 only. Don't forget to Mention, Q.P. Set (P/Q/R/S) on Top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes

No.

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
- A) A person is in the business of buying and selling items. He has 10 units in stock and plans for the next three periods. He can buy the item at the rate of Rs 50, 55 and 58 at the beginning of periods 1, 2 and 3 and can sell them at Rs 60, 64 and 66 at the end of the three periods. He can use the money earned by selling at the end of the period to buy items at the beginning of the next period. He can buy a maximum of 200 per period. He can borrow money at the rate of 2% per period at the beginning of each period. He can borrow a maximum of Rs 8000 per period and he cannot borrow more than Rs 20000 in total. He has to pay back all the loans with interest at the end of the third period.

(for sub questions 1 to 3)

- 1) What is the correct objective function for this problem?
 - Maximize the total money available at the end of the third period a)
 - Maximize the total money at the end of the third period less total money b) borrowed
 - Maximize the total money at the end of the third period less total money c) paid back including interest
 - d) Maximize the number of items sold at the end of the third period
- 2) How many decision variables are in the formulation?
 - a) 3 b) 6
 - 9 d) 10 c)
- 3) How many constraints (except non-negativity constraints) are in the formulation?

a)	6	b)	9
c)	12	d)	13



Max. Marks: 70

Set

Set

- B) A food stall sells idlis, dosas and poories. A plate of idli has 2 pieces, a plate of dosa has 1 piece while a plate of poori has 2 pieces. They also sell a "combo" which has 2 idlis and 2 poories. A kg of batter costs Rs 60 and twelve spoons of batter. Each piece of idli requires 1 spoon of batter and each dosa requires 1.5 spoons of batter. Each poori piece requires 1 ball of wheat dough and a kg of wheat dough that costs Rs 60 can make 20 balls of dough. The selling prices of the items are Rs 40, 60, 60 and 90 per plate respectively. The owner has Rs 800 with her and estimates the demand for the four items (in plates) as 50, 30, 20 and 10 respectively. There is a penalty cost of Rs 10 for any unmet plate of demand of an item. Idli being the most commonly consumed item, the owner wishes to meet at least 80% of the demand. Formulate an LP problem and answer the following questions: (for sub questions 4 to 6)
 - 4) What is the most suitable objective function for this problem?
 - a) Maximize the total money earned by sale
 - b) Maximize the total money earned by sale less the cost of items bought
 - Maximize the total plates made of all the items c)
 - d) Minimize the unmet demand
 - 5) How many decision variables are in the formulation?
 - a) 3 b) 4 c) 5 d) 8
 - How many constraints (except non-negativity constraints) are in the 6) formulation?
 - a) 3 b) 4
 - c) 5 d) 6
- The size of the payoff matrix of a game can be reduced by using the C) 7) principle of
 - a) Game inversion b) Rotation Reduction
 - Dominance d) c) Game transpose
 - 8) A situation in which a decision maker knows all of the possible outcomes of a decision and also knows the probability associated with each outcome is referred to as _____.
 - a) Certainty Uncertainty b)
 - c) Risk d) Strategy
 - 9) If primal is maximize $40 X_1 + 35 X_2$, subjected to $2 X_1 + 3 X_2 \le 60$ and $4 X_1 + 3 X_2 \le 96$, $X_1, X_2 \ge 0$ the dual will have objective function as _____. a) $3y_1 + 3y_2$ (minimize) $3y_1 - 3y_2$ (maximize) b)
 - c) $60y_1 + 96y_2$ (minimize) d) $60y_1 + 96y_2$ (maximize)
 - The necessary condition for single variable unconstrained optimization 10) problem is _____.
 - $f^1(x^*) \neq 0$ a) $f^1(x^*) = 0$ b)
 - $f^1(x^*) > 0$ c) $f^1(x^*) < 0$ d)
 - If f(x) has only one variable useful, the second derivative $d^2f / (dx^2)$ is 11) positive for its _____.
 - Maximum values b) Minimum values a)
 - Minimax C)

- d) Maxmin



Set S

- In an LPP; Max 5x + 6y. Subject to $2x + 3y \ge 50$, $4x + 3y \ge 100$, the 12) objective function of first phase in 2-phase method is _____.
 - a) 5x + 6y b) c) $+A_1 + A_2$
- +5x + 6y MA₁ MA₂ d) $0x + oy - A_1 - A_2$
- One of the important reason for carrying inventory is to ____ 13)
 - Get quantity discount b)
 - a) Improve customer service c) Maintain operational capability All of the above d)
- 14) A type of decision-making environment is _
 - a) Certainty

Uncertainty b)

c) Risk

- All of the above d)

Seat <u>No.</u> T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019

OPTIMIZATION TECHNIQUES Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory.

- 2) Solve any two out of 3, 4, 5.
- 3) Question No. 6 is compulsory.
- 4) Solve any two out of 7, 8, 9.
- 5) Assume suitable data whenever required.
- 6) Use of non-programmable calculator is allowed

Section – I

Civil Engineering

- Analyze the function $f(x) = 12x^5 45x^4 + 45x^3 + 5$ and classify the Q.2 a) **08** stationary points as maxima, minima and points of inflection. b) Write dual for following Primal 04 Maximize $z = 4x_1 + 3x_2$ Subject to $x_1 + (2/3)x_2 \le 6000$ $x_1 - x_2 \ge 2000$ $x_1 \le 4000$ x₁ unrestricted $x_2 \ge 0$ 80 Q.3 Minimize $z = 3x_1 + 5x_2$ S.T. $x_1 + x_2 \ge 2$ $X_2 \leq 6$ $3x_1 + 2x_2 = 18$ $x_1, x_2 \ge 0$ Incorporate artificial variables and transform the LP problem. Q.4 Solve using Simplex method **08** Maximize $z = 4x_1 - x_2 + 2x_3$ $ST 2x_1 + x_2 + 2x_3 \le 6$ $x_1 - 4x_2 + 2x_3 \le 0$ $5x_1-2x_2-2x_3\leq 4$
 - $x_1, x_2, x_3 \ge 0$

Max. Marks: 56

Set S

SLR-FM-44


Q.5 Consider three factories (F) located in three different cities, producing a particular chemical. The chemical is to be transported to four different warehouses (Wh), from where it is supplied to the customers. The transportation cost per truck load from each factory to each warehouse is determined and are given in the table below. Production and demands are also given in the table below.

	Wh 1	Wh 2	Wh 3	Wh 4	Production
F1	523	682	458	850	60
F2	420	412	362	729	110
F3	670	558	895	695	150
Demand	65	85	80	70	

Find Minimum cost of transportation.

Section – II

- **Q.6** a) What is decision under uncertainty? Explain With example.
 - **b)** Find the value of game graphically.

Player B
Player A
$$\begin{vmatrix} 3 & -3 & 4 \\ -1 & 1 & -3 \end{vmatrix}$$

- Q.7 A stockist purchases an item at the rate of Rs. 40 per piece from a manufacture.
 2000 units of the items are required per year. What should be the order quantity per order if the cost per order is Rs. 15 and the inventory charges per year are 20 paise.
- **Q.8** Using Branch & bound method solve following integer programming problem. **08** Maximize $z = 7x_1 + 9x_2$

S. to. $-x_1 + 3x_2 \le 6$ $7x_1 + x_2 \le 35$ $(0 \le x_1, x_2 \le 7)$ and x_1, x_2 are integers.

Q.9 Write note. (Any two)

- a) Economic Order Quantity
- b) Dynamic Programming
- c) Artificial Neural Network (ANN)

08

04

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** DISASTER MANAGEMENT Day & Date: Wednesday, 27-11-2019 Instructions: 1) Question No.1 is Compulsory. It should be solve within first 30 Minutes in Answer Book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) The primary goal of response to a disaster is
 - a) saving lives, protecting property, environment and meeting basic needs of human beings
 - other living beings after the disaster b)
 - c) both A and B
 - d) none of these

2) The National Disaster Management Authority (NDMA) is at .

- a) New Delhi Mumbai b)
- c) Chennai d) Kolkata
- Currently aIMD maintains a seismological network, consisting of a total of 3) observatories, spread over the entire length and breadth of the

country. a) 84

5)

- b)
- c) 44 d) 24
- 4) _ drought correlates the supply and demand of goods with the all other droughts.
 - a) Meteorological drought
- Hydrological drought b) d) Socio-economic drought

64

- c) Agricultural drought Richter scale is a
 - b)
 - a) logarithmic scale calculus scale c) volumetric scale d) area to vibration ratio scale
- 6) Disaster Management Act was enforceable since
 - 2001 2003 a) b)
 - 2007 c) 2005 d)
- Responsibility for securing the scene, preserving life and treating the 7) wounded is the responsibility of _____.
 - a) first responders
 - b) district disaster management department
 - c) state government
 - d) none of these

Max. Marks: 70

SLR-FM-45

Time: 10:00 AM To 01:00 PM **Duration: 30 Minutes**

Seat

No.

Set

Marks: 14

- 8) Who heads the National Crisis Management Committee?
 - a) Prime Minister

9)

b) President

Ministry of Environment

SLR-FM-45

Set

- c) Cabinet Secretary
- Which of the following statements is/are correct about National disaster response force?

d)

- The parent agency of National Disaster Management Authority is I) Ministry of Home Affairs.
- The Chairman of the NDMA is Home Minister. II)
- a) Only I Only II b)
- c) Both I & II None d)
- 10) The union health minister is a chairman of .
 - Indian Red Cross Society a)
 - National Disaster Management Authority b)
 - c) Indian Medical Association
 - d) None of the above

11) The long-term average time interval between two successive hazard events of a similar size is known as the _

- a) Event period b) Return period
- c) Time Interval
- d) Event Interval
- 12) What does the acronym WFED stand for?
 - a) World Food and Engineering Organizations
 - b) World Flood of Earthquake Organizations
 - c) World Federation of Earthquake Organizations
 - d) World Federation of Engineering Organizations
- Disaster Management Division is nodal agency of . 13)
 - Ministry of home affairs a)
 - Ministry of Finance b)
 - c) Ministry of Agriculture and Farmer's welfare
 - d) Prime Minister's Office
- 14) Every year, Central government provides of the size of the calamity relief fund.
 - 25% a) c) 75%

- b) 50%
- d) No any such specification

		SLR-FM-	45
Seat No.	:	Set	Ρ
		T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT	
Day & Time:	& Dat : 10:0	e: Wednesday, 27-11-2019 Max. Marks: 00 AM To 01:00 PM	: 56
Instru	uctio	 ns: 1) Question No.5 from Section-I is Compulsory. Solve any two questions from Remaining questions. 2) Question No. 9 from Section-II is Compulsory. Solve any two questions from Remaining questions. 3) Figures to right indicate full marks. 	
		Section – I	
Q.2	a)	Define: i) Hazards ii) Disasters Also discuss difference between them.	04
	b)	What do you mean by environmental hazards and environmental stress?	05
Q.3	a) b)	Define drought? Also discuss types and causes of droughts. Define Landslides? Discuss its causes and damage assessment process in brief.	04 05
Q.4	a) b)	 Discuss the causes and control measures of soil erosion. Write a note on: i) Deforestation ii) Population Explosion 	04 05
Q.5	a)	What do you mean by Structural and Non-Structural Mitigation? Discuss in	04
	b)	brief. Discuss various stages in disaster management cycle with help of pictorial representation.	06
		Section – II	
Q.6	a)	Discuss the role of Indian Meteorological observatories in disaster mitigation activities.	04
	b)	Write a note on: Prediction and warning systems of disasters	05
Q.7	a) b)	Discuss the importance of media in disaster management. What is the role of local bodies and NGO's in disaster response activities?	04 05
Q.8	Con Disa the [sider a war disaster circumstances in border region of your country, being a ster Manager, how will you manage this disaster? Discuss with reference to Disaster Management Cycle.	09
Q.9	a) b)	What is the role of NIDM disaster management activities? State various international agencies involved in disaster management activities. Also discuss the role of any three international agencies in disaster management process.	04 06

Seat

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** DISASTER MANAGEMENT

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No.1 is Compulsory. It should be solve within first 30 Minutes in Answer Book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- 1) Who heads the National Crisis Management Committee?
 - a) Prime Minister President b)
 - d) c) Cabinet Secretary Ministry of Environment
- 2) Which of the following statements is/are correct about National disaster response force?
 - I) The parent agency of National Disaster Management Authority is Ministry of Home Affairs.
 - The Chairman of the NDMA is Home Minister. II)
 - Only I Only II a) b)
 - c) Both I & II d) None

3) The union health minister is a chairman of _____.

- Indian Red Cross Society a)
- National Disaster Management Authority b)
- c) Indian Medical Association
- d) None of the above

4) The long-term average time interval between two successive hazard events of a similar size is known as the

- a) Event period Return period b)
- c) Time Interval Event Interval d)
- 5) What does the acronym WFED stand for?
 - a) World Food and Engineering Organizations
 - b) World Flood of Earthquake Organizations
 - c) World Federation of Earthquake Organizations
 - d) World Federation of Engineering Organizations
- 6) Disaster Management Division is nodal agency of _____.
 - Ministry of home affairs a)
 - Ministry of Finance b)
 - Ministry of Agriculture and Farmer's welfare C)
 - d) Prime Minister's Office

Set

Max. Marks: 70

Marks: 14

Set Every year, Central government provides of the size of the 7) calamity relief fund. a) 25% b) 50% c) 75% No any such specification d) 8) The primary goal of response to a disaster is _____ saving lives, protecting property, environment and meeting basic a) needs of human beings b) other living beings after the disaster c) both A and B d) none of these 9) The National Disaster Management Authority (NDMA) is at _____. Mumbai New Delhi b) a) c) Chennai d) Kolkata Currently aIMD maintains a seismological network, consisting of a total of 10) observatories, spread over the entire length and breadth of the country. a) 84 b) 64 c) 44 d) 24 _ drought correlates the supply and demand of goods with the all 11) other droughts. a) Meteorological drought b) Hydrological drought c) Agricultural drought Socio-economic drought d) Richter scale is a _____. 12) a) logarithmic scale b) calculus scale area to vibration ratio scale C) volumetric scale d) 13) Disaster Management Act was enforceable since _____. 2001 2003 a) b) 2005 d) 2007 c) Responsibility for securing the scene, preserving life and treating the 14) wounded is the responsibility of _____. a) first responders b) district disaster management department c) state government d) none of these

Seat No.					Set	Q
		T.E. (Part – II)	(New) (CBCS) I Civil Engi DISASTER MA	Examination Nov/Dec neering NAGEMENT	-2019	
Day & Time:	& Dat : 10:0	e: Wednesday, 27 00 AM To 01:00 P	7-11-2019 M		Max. Marks	s: 56
Instru	uctio	ns: 1) Question N from Rema 2) Question N from Rema 3) Figures to	o.5 from Section-I i ining questions. lo. 9 from Section-II ining questions. right indicate full ma	s Compulsory. Solve any t is Compulsory. Solve any arks.	wo questions	S
			Section	n – I		
Q.2	a)	Define: i) Hazards ii) Disasters Also discuss diffe	erence between the	m.		04
	b)	What do you me	an by environmenta	I hazards and environmen	tal stress?	05
Q.3	a) b)	Define drought? Define Landslide in brief.	Also discuss types s? Discuss its caus	and causes of droughts. es and damage assessme	ent process	04 05
Q.4	a) b)	Discuss the caus Write a note on: i) Deforestatio ii) Population E	es and control mea n Explosion	sures of soil erosion.		04 05
Q.5	a) b)	What do you me brief. Discuss various representation.	an by Structural and stages in disaster m	Non-Structural Mitigation	? Discuss in p of pictorial	04 06
			Sectior) — II		
Q.6	a)	Discuss the role	of Indian Meteorolo	gical observatories in disa	ster	04
	b)	mitigation activiti	es. Prediction and warr	ing systems of disasters		05
Q.7	a) b)	Discuss the impo What is the role of	ortance of media in of local bodies and	disaster management. NGO's in disaster respons	e activities?	04 05
Q.8	Con Disa the	sider a war disast aster Manager, ho Disaster Managen	er circumstances in w will you manage t nent Cycle.	border region of your cou his disaster? Discuss with	ntry, being a reference to	09
Q.9	a) b)	What is the role of State various into activities. Also di disaster manage	of NIDM disaster material agencies scuss the role of an ment process.	anagement activities? involved in disaster managy y three international agend	gement cies in	04 06

Set Q

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** DISASTER MANAGEMENT

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No.1 is Compulsory. It should be solve within first 30 Minutes in Answer Book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- 1) Richter scale is a ____
 - a) logarithmic scale
 - c) volumetric scale d) area to vibration ratio scale
- 2) Disaster Management Act was enforceable since _____.
 - 2001 2003 a) b)
 - c) 2005 d) 2007
- Responsibility for securing the scene, preserving life and treating the 3) wounded is the responsibility of _____.
 - a) first responders
 - b) district disaster management department
 - c) state government
 - d) none of these
- 4) Who heads the National Crisis Management Committee?
 - Prime Minister b) President a)
 - Cabinet Secretary d) Ministry of Environment C)
- Which of the following statements is/are correct about National disaster 5) response force?
 - I) The parent agency of National Disaster Management Authority is Ministry of Home Affairs.
 - The Chairman of the NDMA is Home Minister. II)
 - a) Only I b) Only II
 - c) Both I & II d) None
- 6) The union health minister is a chairman of .
 - a) Indian Red Cross Society
 - b) National Disaster Management Authority
 - Indian Medical Association c)
 - d) None of the above
- The long-term average time interval between two successive hazard 7) events of a similar size is known as the
 - a) Event period b) Return period
 - c) Time Interval Event Interval d)

SLR-FM-45

Set R



calculus scale

b)

Marks: 14

14

Max. Marks: 70

	Set R
8)	 What does the acronym WFED stand for? a) World Food and Engineering Organizations b) World Flood of Earthquake Organizations c) World Federation of Earthquake Organizations d) World Federation of Engineering Organizations
9)	Disaster Management Division is nodal agency of a) Ministry of home affairs b) Ministry of Finance c) Ministry of Agriculture and Farmer's welfare d) Prime Minister's Office
10)	Every year, Central government provides of the size of the calamity relief fund. a) 25% b) 50% b) 75% d) No any such specification
11)	 The primary goal of response to a disaster is a) saving lives, protecting property, environment and meeting basic needs of human beings b) other living beings after the disaster c) both A and B d) none of these
12)	The National Disaster Management Authority (NDMA) is at a) New Delhi b) Mumbai c) Chennai d) Kolkata
13)	Currently alMD maintains a seismological network, consisting of a total of observatories, spread over the entire length and breadth of the country. a) 84 b) 64 c) 44 d) 24
14)	drought correlates the supply and demand of goods with the all other droughts.

- a) Meteorological droughtc) Agricultural drought
- b)
- Hydrological drought Socio-economic drought d)

		SLR-FM-	·45
Seat No.	t	Set	R
		T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT	
Day & Time	& Dat : 10:0	te: Wednesday, 27-11-2019 Max. Marks 00 AM To 01:00 PM	s: 56
Instr	uctic	 ons: 1) Question No.5 from Section-I is Compulsory. Solve any two questions from Remaining questions. 2) Question No. 9 from Section-II is Compulsory. Solve any two questions from Remaining questions. 3) Figures to right indicate full marks. 	6
		Section – I	
Q.2	a)	Define: i) Hazards ii) Disasters Also discuss difference between them.	04
	b)	What do you mean by environmental hazards and environmental stress?	05
Q.3	a) b)	Define drought? Also discuss types and causes of droughts. Define Landslides? Discuss its causes and damage assessment process in brief.	04 05
Q.4	a) b)	Discuss the causes and control measures of soil erosion. Write a note on: i) Deforestation ii) Population Explosion	04 05
Q.5	a)	What do you mean by Structural and Non-Structural Mitigation? Discuss in	04
	b)	brief. Discuss various stages in disaster management cycle with help of pictorial representation.	06
		Section – II	
Q.6	a)	Discuss the role of Indian Meteorological observatories in disaster mitigation activities.	04 05
- -	(a	write a note on: Prediction and warning systems of disasters	05
Q.7	a) b)	Discuss the importance of media in disaster management. What is the role of local bodies and NGO's in disaster response activities?	04 05
Q.8	Cor Disa the	nsider a war disaster circumstances in border region of your country, being a aster Manager, how will you manage this disaster? Discuss with reference to Disaster Management Cycle.	09
Q.9	a) b)	What is the role of NIDM disaster management activities? State various international agencies involved in disaster management activities. Also discuss the role of any three international agencies in disaster management process.	04 06

Set

Max. Marks: 70

Seat No.

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No.1 is Compulsory. It should be solve within first 30 Minutes in Answer Book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- 1) The union health minister is a chairman of _____.
 - a) Indian Red Cross Society
 - b) National Disaster Management Authority
 - c) Indian Medical Association
 - d) None of the above
- 2) The long-term average time interval between two successive hazard events of a similar size is known as the _____.
 - a) Event period b) Return period
 - c) Time Interval d) Event Interval

3) What does the acronym WFED stand for?

- a) World Food and Engineering Organizations
- b) World Flood of Earthquake Organizations
- c) World Federation of Earthquake Organizations
- d) World Federation of Engineering Organizations

4) Disaster Management Division is nodal agency of _____.

- a) Ministry of home affairs
- b) Ministry of Finance
- c) Ministry of Agriculture and Farmer's welfare
- d) Prime Minister's Office
- 5) Every year, Central government provides _____ of the size of the calamity relief fund.
 - a) 25% b) 50%
 - c) 75% d) No any such specification
- 6) The primary goal of response to a disaster is _____
 - a) saving lives, protecting property, environment and meeting basic needs of human beings
 - b) other living beings after the disaster
 - c) both A and B
 - d) none of these
- 7) The National Disaster Management Authority (NDMA) is at _____.
 - a) New Delhi b) Mumbai
 - c) Chennai d) Kolkata

Marks: 14

				Set	S
8)	Cu	rrently alMD maintains a seismolo	ogical the e	network, consisting of a total of entire length and breadth of the	
	cou a) c)	untry. 84 44	b) d)	64 24	
9)	oth	drought correlates the supper droughts.	oly an	d demand of goods with the all	
	a) c)	Meteorological drought Agricultural drought	b) d)	Hydrological drought Socio-economic drought	
10)	Ric a) c)	hter scale is a logarithmic scale volumetric scale	b) d)	calculus scale area to vibration ratio scale	
11)	Dis a) c)	aster Management Act was enfor 2001 2005	rceab b) d)	le since 2003 2007	
12)	Re: wo a) b) c) d)	sponsibility for securing the scene unded is the responsibility of first responders district disaster management de state government none of these	e, pre partn	serving life and treating the	
13)	Wh a) c)	o heads the National Crisis Mana Prime Minister Cabinet Secretary	agemo b) d)	ent Committee? President Ministry of Environment	
14)	Wh res I)	ich of the following statements is, ponse force? The parent agency of National	/are c Disas	orrect about National disaster ter Management Authority is	

- I) Ministry of Home Affairs.
- II) The Chairman of the NDMA is Home Minister.
- Only I a)

- b) Only II
- c) Both I & II
- d) None

		SLR-FM-	45
Seat No.		Set	S
		T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering DISASTER MANAGEMENT	
Day & Time:	& Date : 10:0	e: Wednesday, 27-11-2019 Max. Marks: 0 AM To 01:00 PM	: 56
Instru	uctio	 ns: 1) Question No.5 from Section-I is Compulsory. Solve any two questions from Remaining questions. 2) Question No. 9 from Section-II is Compulsory. Solve any two questions from Remaining questions. 3) Figures to right indicate full marks. 	,
		Section – I	
Q.2	a)	Define: i) Hazards ii) Disasters Also discuss difference between them.	04
	b)	What do you mean by environmental hazards and environmental stress?	05
Q.3	a) b)	Define drought? Also discuss types and causes of droughts. Define Landslides? Discuss its causes and damage assessment process in brief.	04 05
Q.4	a) b)	Discuss the causes and control measures of soil erosion.Write a note on:i) Deforestationii) Population Explosion	04 05
Q.5	a)	What do you mean by Structural and Non-Structural Mitigation? Discuss in brief.	04
	b)	Discuss various stages in disaster management cycle with help of pictorial representation.	06
		Section – II	
Q.6	a)	Discuss the role of Indian Meteorological observatories in disaster mitigation activities.	04
	b)	Write a note on: Prediction and warning systems of disasters	05
Q.7	a) b)	Discuss the importance of media in disaster management. What is the role of local bodies and NGO's in disaster response activities?	04 05
Q.8	Cons Disa the [sider a war disaster circumstances in border region of your country, being a ster Manager, how will you manage this disaster? Discuss with reference to Disaster Management Cycle.	09
Q.9	a) b)	What is the role of NIDM disaster management activities? State various international agencies involved in disaster management activities. Also discuss the role of any three international agencies in disaster management process.	04 06

Seat No.						Set	Ρ
	-	T.E. (Part – II)	(New) (CBCS)	Exam	ination Nov/Dec-2019		
		GEOSYNTHE	CIVILENG	ineeri DRCEI	ng D SOIL STRUCTURES		
Day &	Date	: Thursday, 28-1	11-2019		Max	. Marks	s: 50
Instruc	ction	ANITO 12:00 P IS: 1) Q. No 1 is	compulsory and its	should	be solved in first 20 minute	s in	
		answer boo	ok.			0	
		 Figures to Assume a 	right indicate full m dditional data, if rec	arks. quired a	and state it clearly.		
		N	ICQ/Objective	Гуре (Questions		
Duratio	on: 20	0 Minutes			·	Marks	s: 10
Q.1 (Sente	ence.	alternatives from	the opt	tions and rewrite the		10
1	1)	To protect geos	synthetic from UV e	xposure	e is added to it.		
		c) Benzene		d)	Cement		
2	2)	The shape of a	pertures in geonets	is			
		a) Square c) Triangular		b) d)	Circular Diamond		
3	3)	A planar, polym	eric product consis	ting of	a mesh or net-like regular o	open	
		network of inter	secting tensile-resis	stant el	ements, integrally connected	ed at	
		a) Geotextile		b)	Geogrid		
	1)	c) Geonet	and in the manufac	d)	Geocell	:	
4	+)	synthetic polym	ers generally derive	ed from	l	пу	
		a) Rubber		b)	Fiberglass		
5	5)	Lodian standard	for sampling of ge	u) Ssynthe	Jule		
)	a) IS 800	for sampling of get	b)	IS 14706		
	_ `	c) IS 456		d)	IS 2700		
6	j)	a) Mount flow	tor Instrument	b)	Monev fix Installment		
		c) Metal flow I	ndex	d)	Melt flow Index		
7	7)	The core of GC	L is made of		comont		
		c) clay	лау	d)	timber		
8	3)	Which of the fol	lowing tests measu	ires the	toughness of road aggreg	ates?	
		c) Impact test	rength test	d)	Shape test		
g	9)	The sum of flak	iness index and eld	ongatior	n index should not exceed _		
		a) 15 c) 30		b) d)	20 40		
1	10)	The width of gri	ps for performing th	ne grab	tensile strength is,	-	
		a) 25 mm		b)	10 mm		

c) 15 mm d) 35 mm

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-46

Set P

Max. Marks: 40

Seat No.

Seat No.						Set	Q
	Т	.E. (Part – II)	(New) (CBCS) Civil Eng	Exam	ination Nov/Dec-2019		
	G	BEOSYNTHE	TICS & REINFO	DRCE			
Day & Time: 1	Date: 10:00	Thursday, 28-1 AM To 12:00 P	1-2019 M		Max	. Marks	s: 50
Instruc	ctions	5: 1) Q. No.1 is	compulsory and it	should l	be solved in first 20 minutes	s in	
		answer boo 2) Figures to 3) Assume ac	k. right indicate full m dditional data, if red	narks. puired a	nd state it clearly.		
		N	ICQ/Objective	Tvpe C	Questions		
Duratio	on: 20	Minutes				Marks	s: 10
Q.1 C	Choos	se the correct a	alternatives from	the opt	ions and rewrite the		10
S 1	sentei	1CE. MEL is acronym	for				
	() (a) Mount flow c) Metal flow I	Instrument ndex	b) d)	Money fix Installment Melt flow Index		
2	2) -	The core of GC	is made of	:			
	á	a) bentonite c	lay	d)	cement timber		
3	3) I	Nhich of the fol	lowing tests measu	ures the	toughness of road aggrega	ates?	
		a) Crushing st	rength test	b)	Abrasion test		
Δ	1) -	C) Impact lest	ness index and eld	u) naatior	sindpe lesi		
-	r) (a) 15		b)	20	•	
	(c) 30		d)	40		
5	5)	The width of gri	os for performing tl	he grab	tensile strength is,	·	
	ć	a) 25 mm c) 15 mm		(a (b	10 mm 35 mm		
6	s) -	Fo protect deos	vothetic from LIV e		is added to it		
	,, ;,	a) Plastic		b)	Carbon Black		
	(c) Benzene		d)	Cement		
7	7)	The shape of ap	pertures in geonets	s is			
	ć	a) Square		(a (b	Diamond		
8	3)	A planar. polvm	eric product consis	stina of a	a mesh or net-like regular c	ned	
-	י, ו ו	network of inters	secting tensile-resi called	stant el	ements, integrally connected	ed at	
	ä	a) Geotextile		b)	Geogrid		
	(c) Geonet		d)	Geocell		
9	9) -	The materials up	sed in the manufac	cturing of	of geosynthetics are primari	ily	
	2	a) Rubber	ers generally defly	eu nom b)	 Fiberglass		
	(c) Crude petro	leum oils	d)	Jute		
1	l0) l	ndian standard a) IS 800	for sampling of ge	osynthe b)	etic specimens is IS 14706		

-

-

c) IS 456 d) IS 2700

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-46

Max. Marks: 40

Set Q

Seat					. [_
No.				Se	t	R
	•	Г.Е. (Part – II) (New)	(CBCS) Exam	ination Nov/Dec-2019		
		C	ivil Engineeri	ng		
	D	GEOSYNTHETICS &	REINFORCE	D SOIL STRUCTURES		50
Day & Time:	Date 10:00	: Thursday, 28-11-2019 AM To 12:00 PM		Max. Mar	'KS	: 50
Instru	ction	s: 1) Q. No.1 is compulse answer book.	bry and it should	be solved in first 20 minutes in		
		 Figures to right india Assume additional (cate full marks. data, if required a	and state it clearly.		
		, MCQ/Ob	jective Type (Questions		
Duratio	on: 20) Minutes		Mai	ks	: 10
Q.1 (Choo	se the correct alternativ	ves from the op	tions and rewrite the		10
	sente 1)	The sum of flakiness ind	ex and elongatio	n index should not exceed		
	,	a) 15	b)	20		
	2)	C) 30 The width of guine for new	d) farmainar tha anab	40		
4	2)	a) 25 mm	b)	10 mm		
		c) 15 mm	d)	35 mm		
	3)	To protect geosynthetic f	rom UV exposur	e is added to it.		
		a) Plastic c) Benzene	(d (d	Carbon Black Cement		
2	4)	The shape of apertures i	n geonets is	·		
		a) Square	b)	circular		
Į	5)	A planar, polymeric prod	uct consisting of	a mesh or net-like regular open		
	0)	network of intersecting te	ensile-resistant e	lements, integrally connected at		
		the junctions, is called	b)	Geogrid		
		c) Geonet	d)	Geocell		
6	6)	The materials used in the	e manufacturing	of geosynthetics are primarily		
		a) Rubber	rally derived from b)	i Fiberalass		
		c) Crude petroleum oils	s d)	Jute		
7	7)	Indian standard for samp	ling of geosynthe	etic specimens is		
		a) IS 800 c) IS 456	b) d)	IS 14706 IS 2700		
8	8)	MFI is acronym for	u)	10 21 00		
	-)	a) Mount flow Instrume	nt b)	Money fix Installment		
	2)	c) Metal flow Index	d)	Melt flow Index		
Ç	9)	a) bentonite clav	e or b)	cement		
		c) clay	d)	timber		
	10)	Which of the following te a) Crushing strength te	sts measures the	e toughness of road aggregates? Abrasion test)	

c) Impact test d) Shape test

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-46

Max. Marks: 40

Set R

Seat	
No.	

SLR-FM-46

Seat	
No	

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No.1 is compulsory and it should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume additional data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1	Choose the correct alternatives from the options and rewrite the sentence.			10	
	1)	A planar, polymeric product consistine network of intersecting tensile-resist the junctions, is called	ng of ant el	a mesh or net-like regular open ements, integrally connected at	
		a) Geotextile	b)	Geogrid	
		c) Geonet	d)	Geocell	
	2)	The materials used in the manufacturing of geosynthetics are primarily synthetic polymers generally derived from			
		a) Rubberc) Crude petroleum oils	b) d)	Jute	
	3)	Indian standard for sampling of geos	synthe	etic specimens is	
		a) IS 800	b)	IS 14706	
		c) IS 456	d)	IS 2700	
	4)	MFI is acronym for			
		a) Mount flow Instrument	b)	Money fix Installment	
		c) Metal flow Index	d)	Melt flow Index	
	5)	The core of GCL is made of	<u> </u>		
		a) bentonite clay	b)	cement	
	-)	c) clay	d)	timber	
	6)	Which of the following tests measure	es the	toughness of road aggregates?	
		a) Crushing strength test	d)	Abrasion test	
	7)	The sum of flakings index and alon	u) action	Shape lest	
	7)	a) 15	b)		
		c) 30	d)	40	
	8)	The width of grips for performing the	arab	tensile strength is	
	0)	a) 25 mm	b)	10 mm	
		c) 15 mm	d)	35 mm	
	9)	To protect geosynthetic from UV exp	osure	e is added to it.	
	,	a) Plastic	b)	Carbon Black	
		c) Benzene	d)	Cement	
	10)	The shape of apertures in geonets is	S		
		a) Square	b)	circular	
		c) Triangular	d)	diamond	

Marks: 10

Set S

Max. Marks: 50

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-46

Set S

40

Max. Marks: 40

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Softening point of bitumen to be used for road construction at a place where maximum temperature is 40° should be _ Greater than 40°
 - a) Less than 40°
 - c) Equal to 40°
- 2) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.

b)

d)

None of these

- a) Potholes Ravelling b)
- c) Edge breaking d) Rutting
- Critical combination of stresses for corner region in cement concrete road 3) is
 - a) Load stress + warping stress frictional stress
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress
- In highway construction, rolling starts from _____. 4)
 - a) Sides and proceed to centre
 - b) Centre and proceed to sides
 - c) One side and proceed to other side
 - d) Any of the above
- 5) When the bituminous surfacing is done on already existing black top road, the type of treatment to be given is
 - a) Seal coat Tack coat b) c) Prime coat d) Fog seal
- The maximum spacing of contraction joints in rigid pavements is, _____. 6)
 - a) 2.5m b) 3.5m
 - c) 4.5m d) 5.5m
- 7) Maximum thickness of expansion joint in rigid pavement is _____.
 - a) 10 mm b) 25 mm c) 50 mm d) 100 mm

Set

Max. Marks: 50

Marks: 10



8) Match List-I(Test) with List-II(Purpose) and select the correct answer using the codes: _____.

List – I

A) Impact test

1) Bitumen Toughness 2)

3)

4)

- Los Angeles abrasion test B)
- C) Crushing test
- Stripping test D)

Codes:

- В С D Α
- 2 3 4 1 a) 2 3
- b) 4 1 c) 4 3 2 1
- 2 1 4 3 d)

Most suitable material for highway embankment is _____. 9)

- a) Granular soil c) Silty soil
- Organic clay b) d) Clayey soil
- The most suitable equipment for compacting clayey soil is: ____ 10)
 - a) Smooth wheeled roller
 - c) Sheep foot roller
- Pneumatic tyred roller b)
- d) Vibratory roller

Set P

SLR-FM-47

_.

List – II

Hardness

Strength

Page **3** of **16**

SLR-FM-47

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- Discuss the importance of gross wheel load and contact pressure in stress a) distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- b) Explain the importance of:
 - Softening Point Test i)
 - **Ductility Test of Bitumen** ii)
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- The number of commercial vehicles per day at present count is 6000. d) Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- Mention the specifications of materials and construction steps for Wet Mix e) Macadam.
- List the different distresses in flexible pavement. Explain any two **f**) distresses with suitable remedial measure.
- Explain the causes of for mud pumping in CC pavements. Explain how this g) leads to failure of CC pavement slabs.





h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-47

Set

Ρ

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) The maximum spacing of contraction joints in rigid pavements is,
 - 2.5m b) 3.5m a)
 - 4.5m d) 5.5m c)
- 2) Maximum thickness of expansion joint in rigid pavement is .
 - 25 mm 10 mm a) b)
 - c) 50 mm d) 100 mm
- Match List-I(Test) with List-II(Purpose) and select the correct answer 3) using the codes: _____.
 - List I Impact test
 - A) B) Los Angeles abrasion test
 - C) Crushing test
 - Stripping test D)
 - Codes:
 - В Α
 - С D 2 3 4 1 a)
 - 2 b) 4 1 3
 - 2 4 3 1 C)
 - 2 4 3 d) 1

4) Most suitable material for highway embankment is

a) Granular soil

- b) Organic clay Clayey soil
- c) Silty soil d)
- The most suitable equipment for compacting clayey soil is: _ 5)
 - b) Pneumatic tyred roller d) Vibratory roller
 - c) Sheep foot roller

a) Smooth wheeled roller

- 6) Softening point of bitumen to be used for road construction at a place where maximum temperature is 40° should be .
 - a) Less than 40°
- Greater than 40° b)
- c) Equal to 40° d) None of these

- 1) Bitumen
- 2) Toughness
- 3) Hardness
- 4) Strength

Marks: 10

Max. Marks: 50



SLR-FM-47



List – II



- 7) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - a) Potholes Ravelling b) c) Edge breaking
 - d) Rutting
- 8) Critical combination of stresses for corner region in cement concrete road is _
 - a) Load stress + warping stress frictional stress
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress
- 9) In highway construction, rolling starts from .
 - a) Sides and proceed to centre
 - b) Centre and proceed to sides
 - c) One side and proceed to other side
 - d) Any of the above
- When the bituminous surfacing is done on already existing black top 10) road, the type of treatment to be given is _
 - a) Seal coat
 - c) Prime coat

- Tack coat b)
- d) Fog seal

Page 6 of 16

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- a) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- **b)** Explain the importance of:
 - i) Softening Point Test
 - ii) Ductility Test of Bitumen
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- d) The number of commercial vehicles per day at present count is 6000. Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- e) Mention the specifications of materials and construction steps for Wet Mix Macadam.
- f) List the different distresses in flexible pavement. Explain any two distresses with suitable remedial measure.
- **g)** Explain the causes of for mud pumping in CC pavements. Explain how this leads to failure of CC pavement slabs.

Max. Marks: 40



h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-47

Set Q

No.	
Seat	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

a)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Most suitable material for highway embankment is
 - a) Granular soil c) Silty soil
- Organic clay b) Clayey soil d)
- 2) The most suitable equipment for compacting clayey soil is:
 - Pneumatic tyred roller b)
 - c) Sheep foot roller

Smooth wheeled roller

d) Vibratory roller

Softening point of bitumen to be used for road construction at a place 3) where maximum temperature is 40° should be _____.

- a) Less than 40°
- Greater than 40° b) Equal to 40° None of these c) d)
- 4) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - a) Potholes b) Ravelling
 - d) c) Edge breaking Rutting
- Critical combination of stresses for corner region in cement concrete road 5) is
 - Load stress + warping stress frictional stress a)
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress

In highway construction, rolling starts from _____. 6)

- a) Sides and proceed to centre
- b) Centre and proceed to sides
- c) One side and proceed to other side
- d) Any of the above

When the bituminous surfacing is done on already existing black top 7) road, the type of treatment to be given is _

- a) Seal coat Tack coat b)
- Prime coat d) Fog seal c)

Set R

Max. Marks: 50

Marks: 10

Set R

- The maximum spacing of contraction joints in rigid pavements is, _____. 8)
 - a) 2.5m b)
- 3.5m 5.5m
 - c) 4.5m d)
- 9) Maximum thickness of expansion joint in rigid pavement is _____.
 - a) 10 mm b) 25 mm c) 50 mm
 - 100 mm d)
- 10) Match List-I(Test) with List-II(Purpose) and select the correct answer using the codes: _____.
 - List I
 - Impact test A)
 - B) Los Angeles abrasion test
 - C) Crushing test
 - Stripping test D)

Codes:

Α В С D 2 4 a) 3 1 2 1 3 b) 4 3 2 4 1 C) 2 4 3 d) 1

- List II
- 1) Bitumen
- 2) Toughness
- Hardness 3)
- 4) Strength

40

SLR-FM-47

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- a) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- **b)** Explain the importance of:
 - i) Softening Point Test
 - ii) Ductility Test of Bitumen
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- d) The number of commercial vehicles per day at present count is 6000. Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- e) Mention the specifications of materials and construction steps for Wet Mix Macadam.
- f) List the different distresses in flexible pavement. Explain any two distresses with suitable remedial measure.
- **g)** Explain the causes of for mud pumping in CC pavements. Explain how this leads to failure of CC pavement slabs.



Max. Marks: 40

h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-47

Set R

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Marks: 10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- Critical combination of stresses for corner region in cement concrete road is _____.
 - a) Load stress + warping stress frictional stress
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress

2) In highway construction, rolling starts from _____.

- a) Sides and proceed to centre
- b) Centre and proceed to sides
- c) One side and proceed to other side
- d) Any of the above
- 3) When the bituminous surfacing is done on already existing black top road, the type of treatment to be given is .
 - a) Seal coat b) Tack coat
 - c) Prime coat d) Fog seal
- 4) The maximum spacing of contraction joints in rigid pavements is, _____.
 - a) 2.5m b) 3.5m
 - c) 4.5m d) 5.5m
- 5) Maximum thickness of expansion joint in rigid pavement is _____.
 - a) 10 mm c) 50 mm

- b) 25 mm d) 100 mm
- d) 1



Max. Marks: 50

6) Match List-I(Test) with List-II(Purpose) and select the correct answer using the codes: _____.

List – I

A) Impact test

List – II

Hardness

Strength

SLR-FM-47

Set S

Bitumen
 Toughness

3)

4)

- B) Los Angeles abrasion test
- C) Crushing test
- D) Stripping test

Codes:

- ABCD
- a) 2 3 4 1
- b) 4 1 2 3
- c) 4 3 2 1 d) 2 1 4 3

7) Most suitable material for highway embankment is _____

- a) Granular soilc) Silty soil
- b) Organic clayd) Clayey soil

8) The most suitable equipment for compacting clayey soil is: _

- a) Smooth wheeled rollerc) Sheep foot roller
- b) Pneumatic tyred rollerd) Vibratory roller
- Softening point of bitumen to be used for road construction at a place where maximum temperature is 40° should be _____.
 - a) Less than 40°

- b) Greater than 40°
- c) Equal to 40°
- d) None of these
- 10) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - a) Potholes

- b) Ravelling
- c) Edge breaking
- d) Rutting

40

SLR-FM-47

Explain the importance of:	
i) Softening Point Test	

Ductility Test of Bitumen ii)

Instructions: 1) Attempt any five questions from Q. No.2.

2) Figures to right indicate full marks.

c) Explain various types of joints provided in cement concrete pavement with neat sketches.

Discuss the importance of gross wheel load and contact pressure in stress

distribution pattern and in pavement design. Illustrate with stress distribution

- The number of commercial vehicles per day at present count is 6000. d) Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- Mention the specifications of materials and construction steps for Wet Mix e) Macadam.
- List the different distresses in flexible pavement. Explain any two **f**) distresses with suitable remedial measure.
- Explain the causes of for mud pumping in CC pavements. Explain how this g) leads to failure of CC pavement slabs.

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Civil Engineering
PAVEMENT ANALYSIS AND DESIGN

3) Assume suitable data, if required and state it clearly.

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

diagram.

Answer any five questions.

Seat

No.

Q.2

a)

b)

Max. Marks: 40

Set
h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-47

Set S

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering PLANNING FOR SUSTAINABLE DEVELOPMENT

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Figures to right indicate full marks.

2) Assume any suitable data if needed.

Attempt any five of the following question. (10 marks each)

- **Q.1** Explain main principles of sustainable development.
- **Q.2** Write a short note on Innovation strategies & Environmental Management.
- Q.3 What is institutional theory in sustainable development?
- **Q.4** Write a note on policy responses to environmental degradation.
- **Q.5** As a Civil Engineer discuss measures to be taken for sustainable development in civil engineering projects.
- **Q.6** Explain 'Squaring the circle' concept in sustainable management.
- **Q.7** How innovation contributes in sustainable development? Explain.



Max. Marks: 50

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Marks: 10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

1) KAIZEN Means

Duration: 20 Minutes

- a) Quality improvement Technique
- b) Change to become good
- c) Achieving Quality
- d) None

The underlying cause(s) of TQM deficiencies is (are): 2)

- The failure of managers to understand the concept of quality a)
- b) Costly implementation of quality management system
- c) Lack of employee involvement
- d) All of the given option
- Total quality costs include: 3)
 - a) Prevention costs b) Appraisal costs
 - c) Failure costs d) All of the given options
- 4) MIS structure is based on ____
 - Management Activity Population b) a)
 - c) Both a) and b) None d)

ISO 9000 seek's standardization in terms of 5)

- a) products production procedures b)
- c) suppliers specifications d) procedures to manage quality
- 6) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information system Knowledge system b)
 - c) Database system d) Computer system
- The objective of ISO-9000 family of Quality management is _____ 7)
 - a) Customer satisfaction Employee satisfaction b) Environmental issues
 - c) Skill enhancement d)
- TQM & ISO both focuses on 8)
 - a) Customer b) Employee
 - All of the above c) Supplier d)

Set

Max. Marks: 50

Seat No.



- a) systems designer
- b) project manager
- c) systems owner
- d) systems builder
- 10) Internal information for MIS may come from any one of the following department _____.
 - a) Customers care department
 - c) Marketing department
- b) HR department
- d) Production department

Set P

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2. 2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- d) Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Set

Ρ

40

Max. Marks: 40

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information systemc) Database system
- b) Knowledge systemd) Computer system
- 2) The objective of ISO-9000 family of Quality management is _____
 - a) Customer satisfactionc) Skill enhancement
- b) Employee satisfactiond) Environmental issues
- 3) TQM & ISO both focuses on ____
 - a) Customer b) Employee
 - c) Supplier d) All of the above
- The person who ensures that systems are developed on time, within budget, and with acceptable quality is a _____.
 - a) systems designerc) systems owner
- b) project managerd) systems builder
- s owner d) systems
- 5) Internal information for MIS may come from any one of the following department _____.
 - a) Customers care department
 - c) Marketing department

6) KAIZEN Means _____

- a) Quality improvement Technique
- b) Change to become good
- c) Achieving Quality
- d) None
- 7) The underlying cause(s) of TQM deficiencies is (are): _____
 - a) The failure of managers to understand the concept of quality
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option
- 8) Total quality costs include: _____.
 - a) Prevention costs b)
 - c) Failure costs d) All of the given options

- b) HR departmentd) Production department
- a) Froduction departme

Appraisal costs

Set C

Max. Marks: 50

Marks: 10

SLR-FM-49 Set Q

9) MIS structure is based on _____.

- a) Management Activity _____ b)
- c) Both a) and b)
- b) Populationd) None
- 10) ISO 9000 seek's standardization in terms of _
 - a) products
 - c) suppliers specifications
- erms of _____. b) production procedures
- d) procedures to manage quality

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2.

2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- **d)** Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40



Set

Seat No.

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- The person who ensures that systems are developed on time, within 1) budget, and with acceptable guality is a . project manager
 - a) systems designer
 - b) c) systems owner d)
- 2) Internal information for MIS may come from any one of the following department .
 - a) Customers care department c) Marketing department
 - b) HR department d) Production department

systems builder

- 3) KAIZEN Means
 - a) Quality improvement Technique
 - b) Change to become good
 - c) Achieving Quality
 - d) None
- 4) The underlying cause(s) of TQM deficiencies is (are): ____
 - The failure of managers to understand the concept of quality a)
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option

c) Failure costs

5) Total quality costs include: a) Prevention costs

b) Appraisal costs

d) All of the given options

- 6) MIS structure is based on ____
 - Population a) Management Activity b) c) Both a) and b) d) None
- ISO 9000 seek's standardization in terms of 7)
 - a) products production procedures b)
 - c) suppliers specifications procedures to manage quality d)
- 8) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information system c) Database system
- Knowledge system b) Computer system d)

R

Max. Marks: 50

Marks: 10



- 9) The objective of ISO-9000 family of Quality management is _____.
 - a) Customer satisfaction
- Employee satisfaction b)
- c) Skill enhancement
- Environmental issues d)
- TQM & ISO both focuses on _______b) 10)

 - c) Supplier
- Employee
- All of the above d)

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2. 2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- d) Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40

40

Set R

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

2)

6)

9)

b)

d) None

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10
 - Total quality costs include: 1)
 - a) Prevention costs b) Appraisal costs c) Failure costs
 - MIS structure is based on ____
 - a) Management Activity b)
 - c) Both a) and b)

ISO 9000 seek's standardization in terms of 3)

- a) products c) suppliers specifications d)
- 4) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information system

5) The objective of ISO-9000 family of Quality management is _

- c) Skill enhancement
- b) a) Customer Employee
 - All of the above c) Supplier d)
- 7) The person who ensures that systems are developed on time, within budget, and with acceptable quality is a
 - a) systems designer b)
 - c) systems owner d)
- 8) Internal information for MIS may come from any one of the following department
 - c) Marketing department

c) Achieving Quality

a) Quality improvement Technique Change to become good

SLR-FM-49

Set

Max. Marks: 50

Marks: 10



SLR-FM-49 Set S

- 10) The underlying cause(s) of TQM deficiencies is (are): _____.
 - a) The failure of managers to understand the concept of quality
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option

Seat	
No.	

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2.

2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- **d)** Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40

40

Set S

Seat			
No.			
	T.E. (Part – I	II) (Old) (CGPA) Examination N Civil Engineering	lov/Dec-2019
	S	TRUCTURAL MECHANICS -	111
Dav & D	Date: Friday, 22-11-2	2019	Ma

Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 1 MCQ is compulsory.

- 2) Figures to the right indicate full marks.
- In section I, Q no. 2 is compulsory. Solve any two questions from remaining.
- 4) In section II, solve any three questions.
- 5) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions



- L \
- a) 1 b) 3 c) 2 d) 5

SLR-FM-52

Set P

Max. Marks: 70

				-	
				Set	Ρ
5)	Stra	ain energy due to bending is give	n by		01
,	a)	$\int M^2 dx$	b)	$\int M^2 du$	
		$\int \frac{1}{2EI} dx$		$\int \frac{dEI}{dEI} dx$	
	C)	$\int \frac{M^2}{dx} dx$	d)	$\int \frac{2M^2}{dx} dx$	
		J EI and		J EI and	
6)	The	e carry over factor for prismatic be	eam v	vith far end fixed is	01
	a)	1 -1	d)	0.5	
7)	0) Dro	nod contilover of epop L corrigo		of w kN/m throughout value of	01
7)	pro	pped cantilever of span L carries	UDL	or w kin/m inroughout, value or	01
	a)	wL/4	b)	3wL/8	
	C)	wL/3	d)	5wL/8	
8)	The	e size of stiffness matrix equals to			01
	a)	DSI DSI DIKI	b)	DKI	
	C)	DSI+DKI	d)	DSI-DKI	
9)	Mo	ment required to produce unit rota	ation	is called	01
	a) c)	Rotational stiffness	(d b)	All of the above	
10)	Sha	and of ILD for fixed beam is	ч)		01
10)	a)	Lineaer	b)	Parabolic	01
	c)	All of these	d)	None of these	
11)	The	e size of stiffness matrix for prope	d car	ntilever is	01
	a)	1 X 1	b)	2 X 2	
	C)	3 X 3	d)	4 X 4	
12)	The	e fixed end moment for fixed bear $uu^{2/24}$	n hav	ing udl thought span is	01
	a) c)	wi /24 wi ² /16	(a (b	wi / 12 wi ² /8	
13)	Siz	a of stiffness matrix for frame as	show	nin fig. is	02
13)	a)	3 X 3	b)	4 X 4	02
	c)	2 X 2	d)	1 X 1	
				B	
		≪ 4m (2I) → K 6m (I)	>	
		5m (I)			
		D			
		Fig.No.			

Page **2** of **16**

SLR-FM-52

Seat No.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 2) Figures to the right indicate full marks.

- 3) In section I, Q no. 2 is compulsory. And solve any two questions from remaining.
- 4) In section II, Q. no. 9 is compulsory. And solve any two questions from remaining.
- 5) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve any four.

a) Enlist properties of flexibility method.

7

- b) Determine degree of kinematic indeterminacy of following structure.
- c) Enlist various methods of force methods of analysis.

777

- d) Differentiate between static and kinematic degree of indeterminancy.
- e) Explain Castigliano's theorem.
- **Q.3** Analyze the beam using Consistent deformation method. Refer fig 3.1.



Fig (3.1)

Q.4 Draw SFD and BMD using Strain Energy method. Refer for 4.1.

09







SLR-FM-52

Max. Marks: 56



10





Fig (5.1)

Section – II

- Q.6 A continuous beam ABC has its span AB=6 and BC=8m. Beam is fixed at end A 09 and has simple supports at B and C. Span AB has a centrally applied load of 40KN and the span BC has uniformly distributed load of intensity 25 kN/m. If support C settles by an amount 2.5mm in relation to the supports A and B, analyze by moment distribution method. EI is constant throughout the beam and is equal to 30,000 KN-m².
- Q.7 Derive stiffness matrix for a beam as shown in fig no. 7.1





Q.8 Draw ILD bending moment at D and reaction at A. as shown in fig no 8.1. PlotO9 ordinate at 1m interval. D is a midpoint of span AB.



Q.9 Draw bending moment diagram for structural frame as shown in fig. no. 9.1. Use **10** stiffness approach for analysis.



Fig (9.1)

09



Seat No.			Set Q			
	T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering					
Day & Time:	Date: Friday, 22-11- 10:00 AM To 01:00 I	-2019 PM	Max. Marks: 70			
Instru	 Instructions: 1) Question No. 1 MCQ is compulsory. 2) Figures to the right indicate full marks. 3) In section I, Q no. 2 is compulsory. Solve any two questions from remaining. 4) In section II, solve any three questions. 					
	, 	MCQ/Objective Type	Questions			
Duratio	on: 30 Minutes		Marks: 14			
Q.1 (Choose the correct	alternatives from the op	otions and rewrite the 14			
	sentence. 1) The size of stif a) DSI c) DSI+DKI	fness matrix equals to b) d)	01 DKI DSI-DKI			
2	2) Moment requir a) Translatior c) Rotational	ed to produce unit rotation nal stiffness b) stiffness d)	n is called 01 Axial stiffness All of the above			
ć	3) Shape of ILD fo a) Lineaer c) All of these	or fixed beam is b) e d)	01 Parabolic None of these			
2	4) The size of stif a) 1 X 1 c) 3 X 3	fness matrix for proped ca b) d)	Intilever is 01 2 X 2 4 X 4			
ţ	5) The fixed end r a) wl ² /24 c) wl ² /16	moment for fixed beam ha b) d)	ving udl thought span is 01 wl ² /12 wl ² /8			
e	 Which one of the analysis Consistent Flexibility r Consistent Flexibility r Stiffness r Energy me 	he following doesn't fall ur t deformation method method nethod ethod	nder category of force method? 01			
7	 Compatibility c a) Substitute 	conditions are essentially r	equired to solve, 01 Complex frame			

d) Compound truss c) Redundant frame

Ir

SLR-FM-52



T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 2) Figures to the right indicate full marks.

- 3) In section I, Q no. 2 is compulsory. And solve any two questions from remaining.
- 4) In section II, Q. no. 9 is compulsory. And solve any two questions from remaining.
- 5) Assume additional data if required and mention it clearly.

Section – I

Solve any four. Q.2

- Enlist properties of flexibility method. a)
- b) Determine degree of kinematic indeterminacy of following structure.
- Enlist various methods of force methods of analysis. C)

- Differentiate between static and kinematic degree of indeterminancy. d)
- Explain Castigliano's theorem. e)
- Analyze the beam using Consistent deformation method. Refer fig 3.1. Q.3



Fig (3.1)

Draw SFD and BMD using Strain Energy method. Refer for 4.1. Q.4







Seat No.

Max. Marks: 56

Set

10

09





Fig (5.1)

Section – II

- Q.6 A continuous beam ABC has its span AB=6 and BC=8m. Beam is fixed at end A 09 and has simple supports at B and C. Span AB has a centrally applied load of 40KN and the span BC has uniformly distributed load of intensity 25 kN/m. If support C settles by an amount 2.5mm in relation to the supports A and B, analyze by moment distribution method. El is constant throughout the beam and is equal to 30,000 KN-m².
- Derive stiffness matrix for a beam as shown in fig no. 7.1 Q.7





Q.8 Draw ILD bending moment at D and reaction at A. as shown in fig no 8.1. Plot 09 ordinate at 1m interval. D is a midpoint of span AB.



Draw bending moment diagram for structural frame as shown in fig. no. 9.1. Use Q.9 10 stiffness approach for analysis.



Fig (9.1)

09





T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering					
		STRUCTURAL MECHANICS – III			
Day a Time	& Date : 10:00	e: Friday, 22-11-2019 Max. Marks 0 AM To 01:00 PM	s: 70		
Instr	uctior	 ns: 1) Question No. 1 MCQ is compulsory. 2) Figures to the right indicate full marks. 3) In section I, Q no. 2 is compulsory. Solve any two questions from remaining. 4) In section II, solve any three questions. 5) Assume additional data if required and mention it clearly. 			
_		MCQ/Objective Type Questions			
Dura	tion: 3	30 Minutes Marks	5:14		
Q.1	sente	ose the correct alternatives from the options and rewrite the ence.	14		
	1)	The size of stiffness matrix for proped cantilever isa) 1 X 1b) 2 X 2c) 3 X 3d) 4 X 4	01		
	2)	The fixed end moment for fixed beam having udl thought span is a) $wl^2/24$ b) $wl^2/12$ c) $wl^2/16$ d) $wl^2/8$	01		
	3)	 Which one of the following doesn't fall under category of force method? a) Consistent deformation method b) Flexibility method c) Stiffness method d) Energy method 	01		
	4)	Compatibility conditions are essentially required to solve,a) Substitute frameb) Complex framec) Redundant framed) Compound truss	01		
	5)	Degree of static indeterminancy of frame shown in fig (3.0). frig. (3.0) $Fig. (3.0)$ $Fig. (3.0)$ $frig. (3.0)$	01		
	6)	Degree of kinematic indeterminacy of beam shown in fig (4.0).	01		

...

No.

SLR-FM-52

Set R



D Fig.No.

Set

SLR-FM-52

Max. Marks: 56

R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 2) Figures to the right indicate full marks.

- 3) In section I, Q no. 2 is compulsory. And solve any two questions from remaining.
- 4) In section II, Q. no. 9 is compulsory. And solve any two questions from remaining.
- 5) Assume additional data if required and mention it clearly.

Section – I

Solve any four. Q.2

- Enlist properties of flexibility method. a)
- b) Determine degree of kinematic indeterminacy of following structure.
- Enlist various methods of force methods of analysis. C)

- Differentiate between static and kinematic degree of indeterminancy. d)
- Explain Castigliano's theorem. e)
- Analyze the beam using Consistent deformation method. Refer fig 3.1. Q.3



Fig (3.1)

Draw SFD and BMD using Strain Energy method. Refer for 4.1. Q.4







Seat No.

10





Fig (5.1)

Section – II

- Q.6 A continuous beam ABC has its span AB=6 and BC=8m. Beam is fixed at end A 09 and has simple supports at B and C. Span AB has a centrally applied load of 40KN and the span BC has uniformly distributed load of intensity 25 kN/m. If support C settles by an amount 2.5mm in relation to the supports A and B, analyze by moment distribution method. EI is constant throughout the beam and is equal to 30,000 KN-m².
- Q.7 Derive stiffness matrix for a beam as shown in fig no. 7.1





Q.8 Draw ILD bending moment at D and reaction at A. as shown in fig no 8.1. PlotO9 ordinate at 1m interval. D is a midpoint of span AB.



Q.9 Draw bending moment diagram for structural frame as shown in fig. no. 9.1. Use **10** stiffness approach for analysis.



Fig (9.1)

09



Page **13** of **16**

		Civil Engineering STRUCTURAL MECHANICS – III	
Day Time	& Dat e: 10:0	e: Friday, 22-11-2019 Max. Marks: 0 AM To 01:00 PM	70
Insti	ructio	 ns: 1) Question No. 1 MCQ is compulsory. 2) Figures to the right indicate full marks. 3) In section I, Q no. 2 is compulsory. Solve any two questions from remaining. 4) In section II, solve any three questions. 5) Assume additional data if required and mention it clearly. 	
Dure	tion	MCQ/Objective Type Questions	11
Dura 0 1		warks.	14 11
Q. I	sen	ence.	14
	1)	The carry over factor for prismatic beam with far end fixed isa) 1b) 0.5c) -1d) -0.5	01
	2)	Propped cantilever of span L carries UDL of w kN/m throughout, value of propped reaction is a) wL/4 b) 3wL/8 c) wL/3 d) 5wL/8	01
	3)	The size of stiffness matrix equals toa) DSIb) DKIc) DSI+DKId) DSI-DKI	01
	4)	Moment required to produce unit rotation is calleda) Translational stiffnessb) Axial stiffnessc) Rotational stiffnessd) All of the above	01
	5)	Shape of ILD for fixed beam isa) Lineaerb) Parabolicc) All of thesed) None of these	01
	6)	The size of stiffness matrix for proped cantilever isa) 1 X 1b) 2 X 2c) 3 X 3d) 4 X 4	01
	7)	The fixed end moment for fixed beam having udl thought span is a) $wl^2/24$ b) $wl^2/12$ c) $wl^2/16$ d) $wl^2/8$	01
	8)	Which one of the following doesn't fall under category of force method? a) Consistent deformation method	01

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019

b) Flexibility method c) Stiffness method d) Energy method

Seat No.

SLR-FM-52

Set S



Seat No.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS – III

Day & Date: Friday, 22-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 2) Figures to the right indicate full marks.

- 3) In section I, Q no. 2 is compulsory. And solve any two questions from remaining.
- 4) In section II, Q. no. 9 is compulsory. And solve any two questions from remaining.
- 5) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve any four.

a) Enlist properties of flexibility method.

7

- b) Determine degree of kinematic indeterminacy of following structure.
- c) Enlist various methods of force methods of analysis.

777

- d) Differentiate between static and kinematic degree of indeterminancy.
- e) Explain Castigliano's theorem.

5 m

Q.3 Analyze the beam using Consistent deformation method. Refer fig 3.1.



Fig (3.1)

Q.4 Draw SFD and BMD using Strain Energy method. Refer for 4.1.

09



TTT



60 kN/m

Max. Marks: 56

10





09

SLR-FM-52

Q.5 Analyze the beam using flexibility method.



Fig (5.1)

Section – II

- Q.6 A continuous beam ABC has its span AB=6 and BC=8m. Beam is fixed at end A 09 and has simple supports at B and C. Span AB has a centrally applied load of 40KN and the span BC has uniformly distributed load of intensity 25 kN/m. If support C settles by an amount 2.5mm in relation to the supports A and B, analyze by moment distribution method. EI is constant throughout the beam and is equal to 30,000 KN-m².
- Q.7 Derive stiffness matrix for a beam as shown in fig no. 7.1





Q.8 Draw ILD bending moment at D and reaction at A. as shown in fig no 8.1. PlotO9 ordinate at 1m interval. D is a midpoint of span AB.



Q.9 Draw bending moment diagram for structural frame as shown in fig. no. 9.1. Use **10** stiffness approach for analysis.



Fig (9.1)

between parallel sides	4.5m b) d)	from the shorter side is 2m None	
surveys are not useful fo eas ound cavities	or b) d)	complex boundary layers locating water tables	
ly observed in case of Ir onal	nfinite b) d)	slope is Rotational None	
			Page 1 of 16

GEOTECHNICAL ENGINEERING - II Day & Date: Saturday, 23-11-2019 Max. Marks: 70 Time: 10:00 AM To 01:00 PM **Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. Assume suitable data if necessary but mention it clearly. 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

8)

c) Wedge

-	

Seat No.

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

SLR-FM-53

Set

Marks: 14

14

Choose the correct alternatives from the options and rewrite the Q.1 sentence. Site investigation is necessary for _ 1)

- a) foundation design b) around water studies C)
 - construction planning d) All of these
- 2) In SPT, we terminate the test for no of blows which are obtained to drive the required 30 cm?
 - a) 70 blows 80 blows b) c) 90 blows d) 100 blows
- In shallow foundation if $Rw_1 = 1 \& Rw_2 = 0.5$ than where the water table 3) is
 - a) At base of footing b) Below the footing
 - c) At the ground level d) Any where at the mid
- 4) A soil sample has external diameter as 7 cm and wall thickness of 2.5 mm. The area ratio in percentage will be _
 - 12.88 18.22 a) b) C) 15.97 d) 16.85
- Two columns carrying loads 500kN and 600 kN separated by 5.5m c/c, 5) position of resultant column load with respect to heavier column load is .

a)	2.5m	b)	3.5m
c)	4.5m	d)	None

6) Position of centroid of trapezoidal footing having parallel sides 1m and 2m, distance l

- a) 2.5m
- c) 3m
- Geophysical 7)
 - a) large are c) undergro
 - Failure usual a) Translation

SLR-FM-53 Set P

- 9) The open caisson is _____.
 - a) Open at top and closed at bottom
 - b) Open at top and open at bottom
 - c) Open at bottom and closed at top
 - d) close at top and closed at bottom
- 10) In case of well foundation, grip length is defined as distance between _____.
 - a) Top of well cap and cutting edge
 - b) Bottom of well cap and cutting edge
 - c) Bottom of well and minimum scour level
 - d) Bottom of well and maximum scour level
- 11) Which of following is not a cellular type cofferdam 1.0?
 - a) Braced b) Circular
 - c) Diaphragm d) Clover leaf
- 12) If column carries heavy loads then which type of mat do you recommend _____.
 - a) Slab type c) Cellular
- b) Slab thickened under columnd) Beam and slab type
- 13) While analysing any strip of a mat by conventional method, column loads are multiplied by column load modification factor to _____.
 - a) Make all column load on strip uniform
 - b) To get uniform contact pressure
 - c) To satisfy vertical equilibrium of load
 - d) None
- 14) Negative skin friction on a pile under vertical compressive load acts _____.
 - a) Downward and increase the capacity of pile.
 - b) Downwards and reduce the capacity of pile.
 - c) Upward and increase the capacity of pile.
 - d) None of these

Seat	
No.	

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) In section I, Q. no. 2 is compulsory. Solve any two from remaining.
- 4) In section II, Q. no. 6 is compulsory. Solve any two from remaining.

Section – I

Q.2 Attempt any two questions.

- a) Discuss the assumptions in the Terzaghi's bearing capacity analysis.
- b) Explain the guidelines of IS code to conduct the plate load test.
- c) Explain different types of augures with neat sketch.
- d) Write on effect of water table on bearing capacity.
- Q.3 A) Explain 'General shear failure' and 'Local shear failure'. How do you ascertain whether a foundation soil is likely to fail in General shear failure or Local shear failure?
 B) A circular footing is resting on a stiff saturated clay with unconfined 05
 - B) A circular footing is resting on a stiff saturated clay with unconfined compressive strength of 250 kN/m^2 . The depth of foundation is 1.8 m. Determine the diameter of the footing if the column load is 800 kN. Assume a factor of safety as 3. The bulk unit weight of soil is 20 kN/m³.
- **Q.4 A)** What do you mean by collapsible soil? What care has to be taken while **05** doing construction in this type of soil?
 - B) Explain in detail with neat sketch the application of geotextile for the embankment and the earth retainment.04
- Q.5 a) Explain different types of settlement under the foundations. Write the equation of immediate elastic settlement and consolidation settlement stating the meaning of each term.
 - b) A 30 cm square bearing plate settles by 8 mm in the plate load test on cohesion less soil, when the intensity of loading is 200 kN/ m². Estimate the settlement of the shallow foundation of 2 m x 2 m square under same intensity of loading.

Section – II

Q.6 Attempt any two questions.

- a) Explain Hiley's formula for calculating capacity of pile also explain meaning of each term used in the equation along with the unit for each term.
- **b)** Two plate load test with square plate were performed on a soil deposit for a 25mm settlement following loads were obtained. Determine the size of circular footing to carry a load of 700kN for a limiting settlement of 25mm.

Width of Plate (mm)	Load (kN)
300	70
600	120

Max. Marks: 56

10





- c) Cantilever sheetpile wall of height 5.5 retain and embedded in granular soil having $\gamma = 20kN/m^3$ and $\varphi = 32^0$. Determine embedment depth by using approximate method.
- **d)** Define tilt and shift of a well. Explain with neat sketch any four techniques of rectifying the tilt of well.
- Q.7 A) With neat sketch explain when do you provide isolated footing, combined 04 footing, strap footing and raft footing.
 - B) Design footing for two columns by using following data. If size of each column is 0.5m X 0.5m draw plan, elevation, SFD and BMD showing all relevant calculations? Assume suitable data if required for design purpose. External column is at a clear distance of 0.2m from boundary of plot. External column load 600kN, Internal column load 900kN, spacing c/c, SBC of soil = 200kPa.
- Q.8 a) Explain earth-fill cofferdam with a neat labeled sketch (plan and elevation). 04 Following points need to be explained [suitability w.r.t. depth of water, one advantage, one disadvantage]
 - b) Calculate ultimate capacity of octagonal pile of size 0.5m, length 8m embedded in cohesive soil having shear strength of 45 kN/m². Assume adhesion coefficient between pile and soil as 0.6 what will be the % contribution by bearing.
- **Q.9** a) Analyse the slope shown below by using method of slices $\gamma = 18kN / m^3$, $\varphi = 250$ and c = 5kPa. (Use minimum 8 slices)

4.0 m 4.0 m 6.0 m 0.5 m +1 m 1.2 m 5 m +1 m 1.2 m

b) List any six ideal requirement of a cofferdam.

03

05

Seat

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering GEOTECHNICAL ENGINEERING - II**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - Failure usually observed in case of Infinite slope is _____ 1)
 - Translational a)
 - c) Wedge
 - 2) The open caisson is _____
 - a) Open at top and closed at bottom
 - b) Open at top and open at bottom
 - c) Open at bottom and closed at top
 - d) close at top and closed at bottom
 - 3) In case of well foundation, grip length is defined as distance between _____.
 - Top of well cap and cutting edge a)
 - b) Bottom of well cap and cutting edge
 - c) Bottom of well and minimum scour level
 - d) Bottom of well and maximum scour level
 - Which of following is not a cellular type cofferdam 1.0? 4)
 - a) Braced b) Circular
 - c) Diaphragm d) Clover leaf

If column carries heavy loads then which type of mat do you recommend _____. 5)

- Slab thickened under column a) Slab type b)
- c) Cellular d) Beam and slab type
- 6) While analysing any strip of a mat by conventional method, column loads are multiplied by column load modification factor to
 - Make all column load on strip uniform a)
 - b) To get uniform contact pressure
 - c) To satisfy vertical equilibrium of load
 - d) None

Max. Marks: 70

Marks: 14

14

Set

SLR-FM-53



None

- b) d)

			Set	Q
7)	 Negative skin friction on a pile under a) Downward and increase the cap b) Downwards and reduce the cap c) Upward and increase the capacity d) None of these 	er verti pacity bacity city of	cal compressive load acts of pile. of pile. pile.	
8)	Site investigation is necessary for _ a) foundation design c) construction planning	b) d)	 ground water studies All of these	
9)	In SPT, we terminate the test for no the required 30 cm? a) 70 blows c) 90 blows	of blo b) d)	ows which are obtained to drive 80 blows 100 blows	
10)	In shallow foundation if Rw ₁ = 1 & R is a) At base of footing c) At the ground level	w ₂ = 0 b) d)).5 than where the water table Below the footing Any where at the mid	
11)	A soil sample has external diameter mm. The area ratio in percentage w a) 12.88 c) 15.97	r as 7 rill be _ b) d)	cm and wall thickness of 2.5 18.22 16.85	
12)	Two columns carrying loads 500kN position of resultant column load wit is a) 2.5m	and 6 th resp b)	00 kN separated by 5.5m c/c, bect to heavier column load 3.5m	
13)	 Position of centroid of trapezoidal for 2m, distance between parallel sides a) 2.5m c) 3m 	ooting 3 4.5m b) d)	having parallel sides 1m and from the shorter side is 2m None	
14)	Geophysical surveys are not useful a) large areas c) underground cavities	for b) d)	 complex boundary layers locating water tables	
Seat				
------	--			
No.				

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) In section I, Q. no. 2 is compulsory. Solve any two from remaining.
- 4) In section II, Q. no. 6 is compulsory. Solve any two from remaining.

Section – I

Q.2 Attempt any two questions.

- a) Discuss the assumptions in the Terzaghi's bearing capacity analysis.
- b) Explain the guidelines of IS code to conduct the plate load test.
- c) Explain different types of augures with neat sketch.
- d) Write on effect of water table on bearing capacity.
- Q.3 A) Explain 'General shear failure' and 'Local shear failure'. How do you ascertain whether a foundation soil is likely to fail in General shear failure or Local shear failure?
 B) A circular footing is resting on a stiff saturated clay with unconfined 05
 - B) A circular rooting is resting on a stiff saturated ciay with unconfined compressive strength of 250 kN/m^2 . The depth of foundation is 1.8 m. Determine the diameter of the footing if the column load is 800 kN. Assume a factor of safety as 3. The bulk unit weight of soil is 20 kN/m³.
- **Q.4 A)** What do you mean by collapsible soil? What care has to be taken while **05** doing construction in this type of soil?
 - B) Explain in detail with neat sketch the application of geotextile for the embankment and the earth retainment.04
- Q.5 a) Explain different types of settlement under the foundations. Write the equation of immediate elastic settlement and consolidation settlement stating the meaning of each term.
 - b) A 30 cm square bearing plate settles by 8 mm in the plate load test on cohesion less soil, when the intensity of loading is 200 kN/ m². Estimate the settlement of the shallow foundation of 2 m x 2 m square under same intensity of loading.

Section – II

Q.6 Attempt any two questions.

- a) Explain Hiley's formula for calculating capacity of pile also explain meaning of each term used in the equation along with the unit for each term.
- **b)** Two plate load test with square plate were performed on a soil deposit for a 25mm settlement following loads were obtained. Determine the size of circular footing to carry a load of 700kN for a limiting settlement of 25mm.

Width of Plate (mm)	Load (kN)
300	70
600	120

Max. Marks: 56

10





- c) Cantilever sheetpile wall of height 5.5 retain and embedded in granular soil having $\gamma = 20kN/m^3$ and $\varphi = 32^0$. Determine embedment depth by using approximate method.
- **d)** Define tilt and shift of a well. Explain with neat sketch any four techniques of rectifying the tilt of well.
- Q.7 A) With neat sketch explain when do you provide isolated footing, combined 04 footing, strap footing and raft footing.
 - B) Design footing for two columns by using following data. If size of each column is 0.5m X 0.5m draw plan, elevation, SFD and BMD showing all relevant calculations? Assume suitable data if required for design purpose. External column is at a clear distance of 0.2m from boundary of plot. External column load 600kN, Internal column load 900kN, spacing c/c, SBC of soil = 200kPa.
- Q.8 a) Explain earth-fill cofferdam with a neat labeled sketch (plan and elevation). 04 Following points need to be explained [suitability w.r.t. depth of water, one advantage, one disadvantage]
 - b) Calculate ultimate capacity of octagonal pile of size 0.5m, length 8m embedded in cohesive soil having shear strength of 45 kN/m². Assume adhesion coefficient between pile and soil as 0.6 what will be the % contribution by bearing.
- **Q.9** a) Analyse the slope shown below by using method of slices $\gamma = 18kN / m^3$, $\varphi = 250$ and c = 5kPa. (Use minimum 8 slices)



b) List any six ideal requirement of a cofferdam.

03

05

No.	
Seat	

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering GEOTECHNICAL ENGINEERING - II**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- Two columns carrying loads 500kN and 600 kN separated by 5.5m c/c. 1) position of resultant column load with respect to heavier column load is
 - a) 2.5m b) 3.5m
 - c) 4.5m d) None
- Position of centroid of trapezoidal footing having parallel sides 1m and 2) 2m, distance between parallel sides 4.5m from the shorter side is _____.
 - a) 2.5m 2m b)
 - c) 3m d) None
- 3) Geophysical surveys are not useful for _
 - large areas complex boundary layers b) a) c)

Rotational

- underground cavities locating water tables d)
- Failure usually observed in case of Infinite slope is _ 4)
 - Translational a) b)
 - Wedge None c) d)
- 5) The open caisson is
 - a) Open at top and closed at bottom
 - b) Open at top and open at bottom
 - c) Open at bottom and closed at top
 - d) close at top and closed at bottom

6) In case of well foundation, grip length is defined as distance between

- Top of well cap and cutting edge a)
- b) Bottom of well cap and cutting edge
- c) Bottom of well and minimum scour level
- d) Bottom of well and maximum scour level
- 7) Which of following is not a cellular type cofferdam 1.0? a) Braced Circular
 - b)
 - Diaphragm Clover leaf c) d)

Set R



Marks: 14

14

Max. Marks: 70

- In shallow foundation if $Rw_1 = 1 \& Rw_2 = 0.5$ than where the water table At base of footing b)
 - Below the footing
- Any where at the mid c) At the ground level d)
- 14) A soil sample has external diameter as 7 cm and wall thickness of 2.5 mm. The area ratio in percentage will be
 - a) 12.88 18.22 b)
 - c) 15.97 d) 16.85

- 8) If column carries heavy loads then which type of mat do you recommend _____
 - Slab thickened under column b) Beam and slab type d)
 - a) Slab type c) Cellular
- 9) While analysing any strip of a mat by conventional method, column loads are multiplied by column load modification factor to _____.
 - Make all column load on strip uniform a)
 - b) To get uniform contact pressure
 - c) To satisfy vertical equilibrium of load
 - d) None

12)

13)

is

a)

10) Negative skin friction on a pile under vertical compressive load acts _____.

- a) Downward and increase the capacity of pile.
- Downwards and reduce the capacity of pile. b)
- c) Upward and increase the capacity of pile.
- d) None of these

the required 30 cm?

a) 70 blows

c) 90 blows

- 11) Site investigation is necessary for _____
 - a) foundation design
 - ground water studies c) construction planning
 - d) All of these
 - b)

SLR-FM-53

Set

- - 100 blows d)
- b) 80 blows

In SPT, we terminate the test for no of blows which are obtained to drive

Seat	
No.	

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) In section I, Q. no. 2 is compulsory. Solve any two from remaining.
- 4) In section II, Q. no. 6 is compulsory. Solve any two from remaining.

Section – I

Q.2 Attempt any two questions.

- a) Discuss the assumptions in the Terzaghi's bearing capacity analysis.
- b) Explain the guidelines of IS code to conduct the plate load test.
- c) Explain different types of augures with neat sketch.
- d) Write on effect of water table on bearing capacity.
- Q.3 A) Explain 'General shear failure' and 'Local shear failure'. How do you ascertain whether a foundation soil is likely to fail in General shear failure or Local shear failure?
 B) A circular footing is resting on a stiff saturated clay with unconfined 05
 - B) A circular footing is resting on a stiff saturated clay with unconfined compressive strength of 250 kN/m². The depth of foundation is 1.8 m. Determine the diameter of the footing if the column load is 800 kN. Assume a factor of safety as 3. The bulk unit weight of soil is 20 kN/m³.
- **Q.4 A)** What do you mean by collapsible soil? What care has to be taken while **05** doing construction in this type of soil?
 - B) Explain in detail with neat sketch the application of geotextile for the embankment and the earth retainment.04
- Q.5 a) Explain different types of settlement under the foundations. Write the equation of immediate elastic settlement and consolidation settlement stating the meaning of each term.
 - b) A 30 cm square bearing plate settles by 8 mm in the plate load test on cohesion less soil, when the intensity of loading is 200 kN/ m². Estimate the settlement of the shallow foundation of 2 m x 2 m square under same intensity of loading.

Section – II

Q.6 Attempt any two questions.

- a) Explain Hiley's formula for calculating capacity of pile also explain meaning of each term used in the equation along with the unit for each term.
- **b)** Two plate load test with square plate were performed on a soil deposit for a 25mm settlement following loads were obtained. Determine the size of circular footing to carry a load of 700kN for a limiting settlement of 25mm.

Width of Plate (mm)	Load (kN)
300	70
600	120

Max. Marks: 56

10





- c) Cantilever sheetpile wall of height 5.5 retain and embedded in granular soil having $\gamma = 20kN/m^3$ and $\varphi = 32^0$. Determine embedment depth by using approximate method.
- d) Define tilt and shift of a well. Explain with neat sketch any four techniques of rectifying the tilt of well.
- Q.7 A) With neat sketch explain when do you provide isolated footing, combined 04 footing, strap footing and raft footing.
 - B) Design footing for two columns by using following data. If size of each column is 0.5m X 0.5m draw plan, elevation, SFD and BMD showing all relevant calculations? Assume suitable data if required for design purpose. External column is at a clear distance of 0.2m from boundary of plot. External column load 600kN, Internal column load 900kN, spacing c/c, SBC of soil = 200kPa.
- Q.8 a) Explain earth-fill cofferdam with a neat labeled sketch (plan and elevation). 04 Following points need to be explained [suitability w.r.t. depth of water, one advantage, one disadvantage]
 - b) Calculate ultimate capacity of octagonal pile of size 0.5m, length 8m embedded in cohesive soil having shear strength of 45 kN/m². Assume adhesion coefficient between pile and soil as 0.6 what will be the % contribution by bearing.
- **Q.9** a) Analyse the slope shown below by using method of slices $\gamma = 18kN / m^3$, $\varphi = 250$ and c = 5kPa. (Use minimum 8 slices)



b) List any six ideal requirement of a cofferdam.



05

Seat	
No.	

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering GEOTECHNICAL ENGINEERING - II**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - In case of well foundation, grip length is defined as distance between _____. 1)
 - Top of well cap and cutting edge a)
 - b) Bottom of well cap and cutting edge
 - c) Bottom of well and minimum scour level
 - d) Bottom of well and maximum scour level
 - 2) Which of following is not a cellular type cofferdam 1.0?
 - a) Braced b) Circular
 - Clover leaf c) Diaphragm d)
 - If column carries heavy loads then which type of mat do you recommend _____. 3)
 - a) Slab type b) Slab thickened under column
 - c) Cellular d) Beam and slab type
 - 4) While analysing any strip of a mat by conventional method, column loads are multiplied by column load modification factor to _____.
 - a) Make all column load on strip uniform
 - b) To get uniform contact pressure
 - c) To satisfy vertical equilibrium of load
 - d) None

5) Negative skin friction on a pile under vertical compressive load acts

- a) Downward and increase the capacity of pile.
- Downwards and reduce the capacity of pile. b)
- c) Upward and increase the capacity of pile.
- d) None of these
- Site investigation is necessary for _ 6)
 - a) foundation design b) ground water studies All of these
 - c) construction planning d)
- In SPT, we terminate the test for no of blows which are obtained to drive 7) the required 30 cm? 80 blows

b)

- a) 70 blows
- c) 90 blows d) 100 blows

Max. Marks: 70

Marks: 14

14

				J EL
8)	In s is _	hallow foundation if Rw ₁ = 1 & Rw	w ₂ = C	0.5 than where the water table
	a)	At base of footing	b)	Below the footing
	c)	At the ground level	d)	Any where at the mid
9)	A so mm	oil sample has external diameter . The area ratio in percentage wi	as 7 II be _	cm and wall thickness of 2.5
	a)	12.88	b)	18.22
	c)	15.97	d)	16.85
10)	Two pos is _	o columns carrying loads 500kN a ition of resultant column load with	and 6 n resp	00 kN separated by 5.5m c/c, bect to heavier column load
	a)	2.5m	b)	3.5m
	c)	4.5m	d)	None
11)	Pos	ition of centroid of trapezoidal for	oting	having parallel sides 1m and
	2m,	distance between parallel sides	4.5m	from the shorter side is
	a)	2.5m	b)	2m
	c)	3m	d)	None
12)	Geo	ophysical surveys are not useful f	or	
	a)	large areas	b)	complex boundary layers
	c)	underground cavities	d)	locating water tables
13)	Fail	ure usually observed in case of I	nfinite	e slope is
	a)	Translational	b)	Rotational
	c)	Wedge	d)	None
14)	The a)	open caisson is Open at top and closed at bottor	n	

- b) Open at top and open at bottomc) Open at bottom and closed at topd) close at top and closed at bottom

SLR-FM-53 Set S

Seat	
No.	

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING – II

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) In section I, Q. no. 2 is compulsory. Solve any two from remaining.
- 4) In section II, Q. no. 6 is compulsory. Solve any two from remaining.

Section – I

Q.2 Attempt any two questions.

- a) Discuss the assumptions in the Terzaghi's bearing capacity analysis.
- b) Explain the guidelines of IS code to conduct the plate load test.
- c) Explain different types of augures with neat sketch.
- d) Write on effect of water table on bearing capacity.
- Q.3 A) Explain 'General shear failure' and 'Local shear failure'. How do you ascertain whether a foundation soil is likely to fail in General shear failure or Local shear failure?
 B) A circular footing is resting on a stiff saturated clay with unconfined 05
 - B) A circular footing is resting on a stiff saturated clay with unconfined compressive strength of 250 kN/m². The depth of foundation is 1.8 m. Determine the diameter of the footing if the column load is 800 kN. Assume a factor of safety as 3. The bulk unit weight of soil is 20 kN/m³.
- **Q.4 A)** What do you mean by collapsible soil? What care has to be taken while **05** doing construction in this type of soil?
 - B) Explain in detail with neat sketch the application of geotextile for the embankment and the earth retainment.04
- Q.5 a) Explain different types of settlement under the foundations. Write the equation of immediate elastic settlement and consolidation settlement stating the meaning of each term.
 - b) A 30 cm square bearing plate settles by 8 mm in the plate load test on cohesion less soil, when the intensity of loading is 200 kN/ m². Estimate the settlement of the shallow foundation of 2 m x 2 m square under same intensity of loading.

Section – II

Q.6 Attempt any two questions.

- a) Explain Hiley's formula for calculating capacity of pile also explain meaning of each term used in the equation along with the unit for each term.
- **b)** Two plate load test with square plate were performed on a soil deposit for a 25mm settlement following loads were obtained. Determine the size of circular footing to carry a load of 700kN for a limiting settlement of 25mm.

Width of Plate (mm)	Load (kN)
300	70
600	120

Max. Marks: 56

10





- c) Cantilever sheetpile wall of height 5.5 retain and embedded in granular soil having $\gamma = 20kN/m^3$ and $\varphi = 32^0$. Determine embedment depth by using approximate method.
- **d)** Define tilt and shift of a well. Explain with neat sketch any four techniques of rectifying the tilt of well.
- Q.7 A) With neat sketch explain when do you provide isolated footing, combined 04 footing, strap footing and raft footing.
 - B) Design footing for two columns by using following data. If size of each column is 0.5m X 0.5m draw plan, elevation, SFD and BMD showing all relevant calculations? Assume suitable data if required for design purpose. External column is at a clear distance of 0.2m from boundary of plot. External column load 600kN, Internal column load 900kN, spacing c/c, SBC of soil = 200kPa.
- Q.8 a) Explain earth-fill cofferdam with a neat labeled sketch (plan and elevation). 04 Following points need to be explained [suitability w.r.t. depth of water, one advantage, one disadvantage]
 - b) Calculate ultimate capacity of octagonal pile of size 0.5m, length 8m embedded in cohesive soil having shear strength of 45 kN/m². Assume adhesion coefficient between pile and soil as 0.6 what will be the % contribution by bearing.
- **Q.9** a) Analyse the slope shown below by using method of slices $\gamma = 18kN / m^3$, $\varphi = 250$ and c = 5kPa. (Use minimum 8 slices)



b) List any six ideal requirement of a cofferdam.

03

05

Day Time	& Dat e: 10:0	te: Monday, 25-11-2019 00 AM To 01:00 PM		Max. Marks: 70
Instr	ructio	 ans: 1) Q. No. 1 is compulsory and book. 2) Figures to the right indicate 3) Assume suitable data if nee 4) Use of non programmable 	l it should e full mark cessary. calculator	be solved in first 30 minutes in answer s. is allowed.
		MCQ/Objecti	ve Type	Questions
Dura	ation: (30 Minutes		Marks: 14
Q.1	Cho 1)	 bose the correct alternatives from Standard BOD value is measured temperature. a) 3,20 c) 5,20 	m the op t ed after b) d)	tions and rewrite the sentence. 14 days and at°C 5,30 7,30
	2)	Determination of solids in waste a) Calorimetric c) Both a & b	water san b) d)	nple is procedure. Gravimetric None of these
	3)	system is unhygienic met a) Water carriage c) Storm water	hod. b) d)	Dry All of above
	4)	Function of screen chamber is to a) Heavy solids c) Volatile solids	o remove b) d)	 Dissolved solids Large suspended solids
	5)	treatment has endless dit a) Oxidation pond c) Aerate lagoon	ch for hig b) d)	her aeration period. Oxidation ditch All of above
	6)	Max. population that can be serv a) 100 c) 300	ved by us b) d)	ing septic tank is 200 400
	7)	Example of attached growth pro a) Trickling filter	cess is/ar b)	e Rotating biological contactor

d)

Due to incomplete combustion of fuels from petrol engines, the gas liberated

b)

d)

ASP

Со

He

Seat	
No.	

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

ENVIRONMENTAL ENGG. - II

Day & Date: Monday. 25-11-2019 Time: 10

c) Both a and b

is ____. a) Co₂

c) N_2

8)

SLR-FM-54

Set Ρ

Set

- 9) Electrostatic precipitator is a device to control _____.
 - a) So₂ emission in water coagulation
 - b) Particulate emission
 - c) Both (a) & (b)
 - d) Precipitation of AI(OH)₃
- The effect of increasing diameter of sewer on the self cleansing velocity is 10)
 - a) To decrease it b) To increase it
 - c) Fluctuating it d) Nil
- 11) The most common method of wastewater disposal is .
 - Dilution in surface water b)
 - c) Rapid infiltration application in irrigation d)
- _____ pollution that originates from multiple sources over relatively large 12) area.
 - a) Point source

a) Evaporation

- b) None point source
- Effluent source c) Influent source d)
- 13) The Interplay between the deoxygenation and reaeration produces a well defined profile of in stream.
 - a) Self purification b)
 - c) B.O.D d) Photosynthesis
- Presence of _____ on surface of wastewater prevents oxygen to penetrate. 14)
 - a) Oil and grease
- b) Suspended solids d)

D.O.

Microorganism c)

Calcium

Max. Marks: 56

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL ENGG. – II

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No. 2 is Compulsory. Solve any two questions from Section – I.

- 2) Q. no.9 is compulsory. Solve any two questions from remaining question 6 to 8 from section II.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Use of non programmable calculator is allowed.

Section – I

- Q.2 a)Draw a general flowsheet for a sewage treatment plant for a city having
population of 10 lacs. Write function of each unit in tabular format.05
 - b) Calculate BOD₃ at 27°C for a sewage sample whose standard BOD is 450 mg/Lit. Take k=0. 12/day (Base 10).
- **Q.3 a)** Compare conventional and high rate trickling filter.
 - b) The total area of district is 15 ha. The following data shows various types of areas and the corresponding runoff coefficients of a town. Determine coefficient of runoff for the area. Also find maximum runoff by rational formula. Assume Rainfall intensity as $R_i = 40 \text{ mm/hr}$.

Type of surface	% of total area	Runoff coefficient
Roof surface	20	0.85
Unpaved street	15	0.25
Wooded area	10	0.15
Parks and lawns	40	0.20
Hard pavements	5	0.85
Macadam roads	10	0.30

- **Q.4 a)** Explain 'bacteria-algal' symbiosis.
 - **b)** Design aseptic tank for 200 users

Q.5 a) Write short note.

- a) NRC equation
- b) Classification of screens
- c) Steps in anaerobic digestion process

Section – II

- **Q.6 a)** Write Streeter- Phelp's equation and explain meaning of each and every **05** term in it.
 - b) Explain the functional elements of Municipal solid waste management with flow diagram?
 05

Set P

04 05

09

Set P

08

- Q.7 a) A wastewater effluent of 560 l/s with a B.O.D of 50 mg/l, D.O. is 3 mg/l and Temperature of 23°C Enters a river where the flow is 28 m³/s, and B.O.D is 4 mg/l, D.O. is 8.2 mg/l, temperature is of 17°C k₁ of waste is 0.10 per day at 20° C. The velocity of water the river downstream is 0.18 m/s and depth of 1.2 m. determine the following after mixing of waste water with the river water.
 - i) Combined Discharge
 - ii) BOD
 - iii) Do
 - iv) Temperature
 - b) Explain the Disposal of refuse by trenching method. Also give advantage of this method.
 05

Q.8	a)	Give the causes of Air pollution? Explain it's general effect on human health.	05
	b)	Define Inversion? Explain its types with neat diagram.	05

Q.9 Write short note. (Any Two)

- a) D.O. Sag Curve
- b) Indore Method of Composting
- c) ESP

Set

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL ENGG. – II

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Due to incomplete combustion of fuels from petrol engines, the gas liberated
 - is _____. a) Co₂ b) Co
 - c) N_2 d) He
- 2) Electrostatic precipitator is a device to control _____.
 - a) So₂ emission in water coagulation
 - b) Particulate emission
 - c) Both (a) & (b)

a) Evaporation

- d) Precipitation of AI(OH)₃
- 3) The effect of increasing diameter of sewer on the self cleansing velocity is
 - a) To decrease it b) To increase it
 - c) Fluctuating it d) Nil
- 4) The most common method of wastewater disposal is _____.
 - b) Dilution in surface water

D.O.

- c) Rapid infiltration d) application in irrigation
- 5) _____ pollution that originates from multiple sources over relatively large area.
 - a) Point source b) None point source
 - c) Influent source d) Effluent source
- 6) The Interplay between the deoxygenation and reaeration produces a well defined profile of _____ in stream.
 - a) Self purification b)
 - c) B.O.D d) Photosynthesis
- 7) Presence of _____ on surface of wastewater prevents oxygen to penetrate.
 - a) Oil and grease b) Suspended solids
 - c) Microorganism d) Calcium
- 8) Standard BOD value is measured after _____ days and at _____°C temperature.
 a) 3,20
 b) 5,30
 - c) 5,20 d) 7,30

SLR-FM-54

Max. Marks: 70



Marks: 14

			SLR-FM-54
			Set Q
9)	Determination of solids in wastewar a) Calorimetric c) Both a & b	ter sar b) d)	nple is procedure. Gravimetric None of these
10)	 system is unhygienic method a) Water carriage c) Storm water 	d. b) d)	Dry All of above
11)	Function of screen chamber is to re a) Heavy solids c) Volatile solids	emove b) d)	 Dissolved solids Large suspended solids
12)	 treatment has endless ditcha) Oxidation pondc) Aerate lagoon	for hig b) d)	her aeration period. Oxidation ditch All of above
13)	Max. population that can be served a) 100	l by us b)	ing septic tank is 200

- c) 300
 d) 400
 14) Example of attached growth process is/are _____
 - a) Trickling filter

b) Rotating biological contactor

c) Both a and b

d) ASP

Max. Marks: 56

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL ENGG. – II

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No. 2 is Compulsory. Solve any two questions from Section – I.

- 2) Q. no.9 is compulsory. Solve any two questions from remaining question 6 to 8 from section II.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Use of non programmable calculator is allowed.

Section – I

- Q.2 a)Draw a general flowsheet for a sewage treatment plant for a city having
population of 10 lacs. Write function of each unit in tabular format.05
 - b) Calculate BOD₃ at 27°C for a sewage sample whose standard BOD is 450 mg/Lit. Take k=0. 12/day (Base 10).
- **Q.3 a)** Compare conventional and high rate trickling filter.
 - b) The total area of district is 15 ha. The following data shows various types of areas and the corresponding runoff coefficients of a town. Determine coefficient of runoff for the area. Also find maximum runoff by rational formula. Assume Rainfall intensity as $R_i = 40$ mm/hr.

Type of surface	% of total area	Runoff coefficient
Roof surface	20	0.85
Unpaved street	15	0.25
Wooded area	10	0.15
Parks and lawns	40	0.20
Hard pavements	5	0.85
Macadam roads	10	0.30

Q.4 a) Explain 'bacteria-algal' symbiosis.

b) Design aseptic tank for 200 users

Q.5 a) Write short note.

- a) NRC equation
- b) Classification of screens
- c) Steps in anaerobic digestion process

Section – II

- Q.6 a) Write Streeter- Phelp's equation and explain meaning of each and every 05 term in it.
 - b) Explain the functional elements of Municipal solid waste management with flow diagram?
 05

Set Q

04 05

09

Set Q

08

- Q.7 a) A wastewater effluent of 560 l/s with a B.O.D of 50 mg/l, D.O. is 3 mg/l and Temperature of 23°C Enters a river where the flow is 28 m³/s, and B.O.D is 4 mg/l, D.O. is 8.2 mg/l, temperature is of 17°C k₁ of waste is 0.10 per day at 20° C. The velocity of water the river downstream is 0.18 m/s and depth of 1.2 m. determine the following after mixing of waste water with the river water.
 - i) Combined Discharge
 - ii) BOD
 - iii) Do
 - iv) Temperature
 - b) Explain the Disposal of refuse by trenching method. Also give advantage of this method.
 05

Q.8	a)	Give the causes of Air pollution? Explain it's general effect on human health.	05
	b)	Define Inversion? Explain its types with neat diagram.	05

Q.9 Write short note. (Any Two)

- a) D.O. Sag Curve
- b) Indore Method of Composting
- c) ESP

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering ENVIRONMENTAL ENGG. - II

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- _____ treatment has endless ditch for higher aeration period. 1)
 - a) Oxidation pond
 - c) Aerate lagoon
- 2) Max. population that can be served by using septic tank is _____.
 - a) 100 b) 200
 - 300 d) 400 c)

3) Example of attached growth process is/are

- a) Trickling filter Rotating biological contactor b)
- c) Both a and b d) ASP
- Due to incomplete combustion of fuels from petrol engines, the gas liberated 4) is _
 - a) Co₂ b) Со
 - d) He c) N_2
- 5) Electrostatic precipitator is a device to control
 - a) So₂ emission in water coagulation
 - b) Particulate emission
 - c) Both (a) & (b)
 - d) Precipitation of AI(OH)₃

6) The effect of increasing diameter of sewer on the self cleansing velocity is

- To decrease it b) To increase it a)
- c) Fluctuating it Nil d)
- The most common method of wastewater disposal is ____ 7) a) Evaporation
 - Dilution in surface water b)
 - c) Rapid infiltration d) application in irrigation
- 8) pollution that originates from multiple sources over relatively large area.
 - a) Point source b) None point source
 - Effluent source c) Influent source d)

SLR-FM-54



Max. Marks: 70

Marks: 14



- b) Oxidation ditch
- d) All of above

			Set	R
9)	The Interplay between the deoxyger defined profile of in stream. a) Self purification c) B.O.D	nation b) d)	and reaeration produces a well D.O. Photosynthesis	
10)	Presence of on surface of wa a) Oil and grease c) Microorganism	b) d)	ater prevents oxygen to penetrate. Suspended solids Calcium	
11)	Standard BOD value is measured at temperature. a) 3,20 c) 5,20	fter b) d)	days and at°C 5,30 7,30	
12)	Determination of solids in wastewate a) Calorimetric c) Both a & b	er sar b) d)	nple is procedure. Gravimetric None of these	
13)	 system is unhygienic methoda) Water carriagec) Storm water	b) d)	Dry All of above	
14)	Function of screen chamber is to reala) Heavy solidsc) Volatile solids	move b) d)	 Dissolved solids Large suspended solids	

Max. Marks: 56

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENVIRONMENTAL ENGG. – II

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No. 2 is Compulsory. Solve any two questions from Section – I.

- 2) Q. no.9 is compulsory. Solve any two questions from remaining question 6 to 8 from section II.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Use of non programmable calculator is allowed.

Section – I

- Q.2 a)Draw a general flowsheet for a sewage treatment plant for a city having
population of 10 lacs. Write function of each unit in tabular format.05
 - b) Calculate BOD₃ at 27°C for a sewage sample whose standard BOD is 450 mg/Lit. Take k=0. 12/day (Base 10).
- **Q.3** a) Compare conventional and high rate trickling filter.
 - b) The total area of district is 15 ha. The following data shows various types of areas and the corresponding runoff coefficients of a town. Determine coefficient of runoff for the area. Also find maximum runoff by rational formula. Assume Rainfall intensity as $R_i = 40 \text{ mm/hr}$.

Type of surface	% of total area	Runoff coefficient
Roof surface	20	0.85
Unpaved street	15	0.25
Wooded area	10	0.15
Parks and lawns	40	0.20
Hard pavements	5	0.85
Macadam roads	10	0.30

- **Q.4 a)** Explain 'bacteria-algal' symbiosis.
 - **b)** Design aseptic tank for 200 users

Q.5 a) Write short note.

- a) NRC equation
- b) Classification of screens
- c) Steps in anaerobic digestion process

Section – II

- **Q.6 a)** Write Streeter- Phelp's equation and explain meaning of each and every **05** term in it.
 - b) Explain the functional elements of Municipal solid waste management with flow diagram?
 05

Set R

04 05

04

Set R

08

- Q.7 a) A wastewater effluent of 560 l/s with a B.O.D of 50 mg/l, D.O. is 3 mg/l and Temperature of 23°C Enters a river where the flow is 28 m³/s, and B.O.D is 4 mg/l, D.O. is 8.2 mg/l, temperature is of 17°C k₁ of waste is 0.10 per day at 20° C. The velocity of water the river downstream is 0.18 m/s and depth of 1.2 m. determine the following after mixing of waste water with the river water.
 - i) Combined Discharge
 - ii) BOD
 - iii) Do
 - iv) Temperature
 - b) Explain the Disposal of refuse by trenching method. Also give advantage of this method.
 05

Q.8	a)	Give the causes of Air pollution? Explain it's general effect on human health.	05
	b)	Define Inversion? Explain its types with neat diagram.	05

Q.9 Write short note. (Any Two)

- a) D.O. Sag Curve
- b) Indore Method of Composting
- c) ESP

Set

Max. Marks: 70

Marks: 14

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGG. – II**

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Choose the correct alternatives from the options and rewrite the sentence. 14 Q.1

- The effect of increasing diameter of sewer on the self cleansing velocity is 1)
 - a) To decrease it To increase it b)
 - d) c) Fluctuating it Nil

2) The most common method of wastewater disposal is

- a) Evaporation b) Dilution in surface water
- c) Rapid infiltration d) application in irrigation
- 3) _____ pollution that originates from multiple sources over relatively large area.
 - a) Point source None point source b)
 - Effluent source c) Influent source d)
- 4) The Interplay between the deoxygenation and reaeration produces a well defined profile of _____ in stream.
 - a) Self purification b) D.O. c) B.O.D
 - d) Photosynthesis

5) Presence of _____ on surface of wastewater prevents oxygen to penetrate.

- a) Oil and grease Suspended solids b)
- Calcium c) Microorganism d)
- 6) Standard BOD value is measured after _____ days and at _____°C temperature.

Dry

a) 3,20 5,30 b) c) 5,20 d) 7,30

7) Determination of solids in wastewater sample is procedure.

Gravimetric a) Calorimetric b) c) Both a & b

- None of these d)
- 8) system is unhygienic method.
 - Water carriage b) a) c)
 - Storm water d) All of above

			SLR-FM-54
			Set S
9)	Function of screen chamber is	to remove	·
	a) Heavy solidsc) Volatile solids	b) d)	Dissolved solids Large suspended solids
10)	treatment has endless	ditch for hig	her aeration period.
	a) Oxidation pondc) Aerate lagoon	b) d)	Oxidation ditch All of above
11)	Max. population that can be se a) 100 c) 300	erved by us b) d)	ing septic tank is 200 400
12)	Example of attached growth p a) Trickling filter c) Both a and b	rocess is/aı b) d)	re Rotating biological contactor ASP
13)	Due to incomplete combustion	of fuels fro	om petrol engines, the gas liberated
	is a) Co ₂ c) N ₂	b) d)	Co He
14)	Electrostatic precipitator is a d a) So ₂ emission in water coa b) Particulate emission	evice to co Igulation	ntrol

- c) Both (a) & (b)
 d) Precipitation of AI(OH)₃

Max. Marks: 56

T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Seat No.

Instructions: 1) Q. No. 2 is Compulsory. Solve any two questions from Section – I.

- 2) Q. no.9 is compulsory. Solve any two questions from remaining question 6 to 8 from section II.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Use of non programmable calculator is allowed.

Section – I

ENVIRONMENTAL ENGG. – II

- Q.2 a)Draw a general flowsheet for a sewage treatment plant for a city having
population of 10 lacs. Write function of each unit in tabular format.05
 - b) Calculate BOD₃ at 27°C for a sewage sample whose standard BOD is 450 mg/Lit. Take k=0. 12/day (Base 10).
- **Q.3 a)** Compare conventional and high rate trickling filter.
 - b) The total area of district is 15 ha. The following data shows various types of areas and the corresponding runoff coefficients of a town. Determine coefficient of runoff for the area. Also find maximum runoff by rational formula. Assume Rainfall intensity as R_i = 40 mm/hr.

Type of surface	% of total area	Runoff coefficient
Roof surface	20	0.85
Unpaved street	15	0.25
Wooded area	10	0.15
Parks and lawns	40	0.20
Hard pavements	5	0.85
Macadam roads	10	0.30

- **Q.4 a)** Explain 'bacteria-algal' symbiosis.
 - **b)** Design aseptic tank for 200 users

Q.5 a) Write short note.

- a) NRC equation
- b) Classification of screens
- c) Steps in anaerobic digestion process

Section – II

- **Q.6 a)** Write Streeter- Phelp's equation and explain meaning of each and every **05** term in it.
 - b) Explain the functional elements of Municipal solid waste management with flow diagram?
 05

Set S

04 05

09

Set S

08

- Q.7 a) A wastewater effluent of 560 l/s with a B.O.D of 50 mg/l, D.O. is 3 mg/l and Temperature of 23°C Enters a river where the flow is 28 m³/s, and B.O.D is 4 mg/l, D.O. is 8.2 mg/l, temperature is of 17°C k₁ of waste is 0.10 per day at 20° C. The velocity of water the river downstream is 0.18 m/s and depth of 1.2 m. determine the following after mixing of waste water with the river water.
 - i) Combined Discharge
 - ii) BOD
 - iii) Do
 - iv) Temperature
 - b) Explain the Disposal of refuse by trenching method. Also give advantage of this method.

Q.8	a)	Give the causes of Air pollution? Explain it's general effect on human health.	05
	b)	Define Inversion? Explain its types with neat diagram.	05

Q.9 Write short note. (Any Two)

- a) D.O. Sag Curve
- b) Indore Method of Composting
- c) ESP

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT – II**

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figure to right indicate full marks.
- 3) Assume suitable data only if required but mention it clearly.
- 4) Use of only on programmable calculator is allowed.
- 5) Draw sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1

14 Choose the correct alternatives from the options and rewrite the

sentence.

6)

C)

- 1) If activities in a network cannot be topologically ordered it indicates that _____.
 - a) there is a redundancy in the project
 - b) precedence relations are consistent
 - a proper acyclic network cannot be drawn c)
 - d) None of the above

2) A project with uncertain activity times has 2 parallel paths which have probabilities of 0.5 and 0.9 of being completed by the target date. The PERT and actual probabilities of project completion of the whole project by the target date are .

- a) 0.4, 0.9 0.45, 0.5 b)
- c) 0.5, 0.45 0.9, 0.4 d)
- 3) The concept of milestones on a project is relevant for _____
 - a) A-O-N networks A-O-A networks b) None of the above
 - c) Precedence Networks d)
- 4) The best technique for handling consumable resources in a project is . **Resource** leveling
 - a) Time/cost tradeoffs
 - b) c) Resource allocation d) Resource aggregation
- 5) The process of utililizing activity floats to obtain an acceptable resource usage profile without increasing project duration is called
 - a) resource aggregation c) resource leveling
- resource planning b) d) resource allocation
- The process of obtaining a minimum duration project schedule for a given set of resources is referred to as ____
 - a) resource aggregation b) critical path scheduling
 - c) resource leveling resource allocation d)
- 7) If the activity time-cost tradeoffs are linear, the project cost duration efficient frontier is _____.
 - a) linear piecewise linear concave
- b) piecewise linear convex
- d) non-linear



Marks: 14

- In recurring deposit scheme ______ factor will be used.
- a) USCRF b) USPWF
 - c) USSFF d) None
- 9) Bank is interested to apply interest rate compounded ______ to the customer.
 - a) Daily b) Monthly
 - c) Quarterly d) Annually
- 10) 15% rate per year compounded monthly is _____ type of interest rate.
 - b) Effective
 - c) Simple d)
- 11) The uniform amount to be invested at the end of each period in order to produce a fixed amount can be calculated using factor.
 - a) USCAF b) USCRF
 - c) USPWF d) USSFF
- 12) The method which has basis to return as the results of dividing the capital invested by the annual net profit is
 - a) Yield method c) PW method

- d)

13) Annuity means

a) Nominal

8)

- a) Payments of equal amount
- b) A series of payment
- c) equal payment at equal time interval
- d) b and c
- Engineering Economics analysis is a method for _____. 14)
 - a) Cost analysis of various project alternatives
 - b) Calculating duration of the project
 - Doing the sensitivity analysis c)
 - d) None of these

- None of these

SLR-FM-55

Set P

- Payback method
- EUAC method
- b)

Set

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – II

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 is compulsory.

2) Answer any two question out of Q.3 to Q.5

3) Answer any two questions out of Q.7 to Q.9

- 4) Figure to right indicate full marks.
- 5) Assume suitable data only if required but mention it clearly.
- 6) Use of only on programmable calculator is allowed.
- 7) Draw sketches wherever necessary.

Section – I

- **Q.2 a)** Explain the Steps in Project Management.
 - b) What is Fulkerson's Rule? Using the details shown below, Draw the CPM
 AOA network and do event numbering. Show critical Path and calculate
 Project duration.

Activity		Duration	Preceding
	Activity	(days)	Activity
Α.	Site selection	7	
В.	Digging well	3	А
C.	Laying field channels	15	В
D.	Procurement of Pump	7	А
E.	Installation of pump	3	D, B
F.	Test run	2	C, E

Q.3 Draw Critical Path and Project Duration. Assuming the activities are scheduled on the Earliest Start Time (EST) calculate the manpower requirement for the project with Histograph.

Activity		Duration	Preceding	Manpower/day
	-	(days)	ACLIVILY	
Α.	Land preparation	3		4
В.	Digging pits	5	A	4
С.	Purchase saplings	3	A	2
D.	Application of FYM	3	В	3
Ε.	Transplants saplings	4	C,D	4

Max. Marks: 56

Q.4 For the project with data given in Table 2

- a) Develop the A-O-A network
- **b)** Under standard PERT assumptions determine the critical path

l apie 2		
Job	Predecessors	Duration (a,m,b)
Α		2,5,8
В		2,2,14
С	A	3,6,9
D	А	2,8,14
E	А	2,8,14
F	B,C	3,6,15
G	D,F	6,15,24
Н	D,F	1,4,7
I	E,H	1,7,13

Q.5 a) Explain the views available in MS Project software.

b) Explain Role of information in decision making.

Section – II

- Q.6 a) What is cash flow diagram? Explain in details with example. 04 Maintenance cost for new bridge with an expected 50 years life was 06 b) estimated to be Rs.10000 each year for the first five years followed by a Rs.100000 expenditure in the 15th year and Rs.100000 expenditure in 30th year. If i = 10% per year, what is the equivalent uniform annual cost over the entire 50 year period? Q.7 a) Which are the various types of Single Payment factor? Explain any one of 05 them. b) A father, on the day his son is born, wishes to determine what amount 04 would have to be paid into an account now bearing interest at 12% compounded quarterly to provide payment of Rs.100000 on his sons 20th birthday? Assist him to determine. Q.8 A project proposed for a new building involves capital investment of 04 a) Rs.100000. It has salvage value of Rs. 20000 and annual receipts is Rs. 32200 & O&M cost is Rs. 22300. What is the internal rate of return, if the life of building is 12 years? What is time value of money? 05 b) Q.9 Write short notes. 09 a) Value engineering
 - b) BOT
 - c) Effective and Nominal interest rate

08

04

04



Set

Under st

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering ENGINEERING MANAGEMENT – II

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figure to right indicate full marks.
- 3) Assume suitable data only if required but mention it clearly.
- 4) Use of only on programmable calculator is allowed.
- 5) Draw sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - In recurring deposit scheme ______ factor will be used. 1)
 - **USPWF** a) USCRF b)
 - c) USSFF d) None
 - 2) Bank is interested to apply interest rate compounded to the customer.
 - a) Daily b) Monthly c) Quarterly d) Annually
 - 3) 15% rate per year compounded monthly is _____ type of interest rate. Nominal a) b) Effective
 - Simple c) d) None of these
 - The uniform amount to be invested at the end of each period in order to 4) produce a fixed amount can be calculated using factor.
 - a) USCAF b) USCRF
 - c) USPWF USSFF d)
 - The method which has basis to return as the results of dividing the capital 5) invested by the annual net profit is _ Payback method
 - a) Yield method b) d) EUAC method
 - c) PW method
 - 6) Annuity means
 - a) Payments of equal amount
 - b) A series of payment
 - c) equal payment at equal time interval
 - d) b and c
 - Engineering Economics analysis is a method for _____. 7)
 - a) Cost analysis of various project alternatives
 - b) Calculating duration of the project
 - c) Doing the sensitivity analysis
 - d) None of these

SLR-FM-55



Max. Marks: 70

Marks: 14

- 8) If activities in a network cannot be topologically ordered it indicates that _____
 - a) there is a redundancy in the project
 - b) precedence relations are consistent
 - c) a proper acyclic network cannot be drawn
 - d) None of the above
- 9) A project with uncertain activity times has 2 parallel paths which have probabilities of 0.5 and 0.9 of being completed by the target date. The PERT and actual probabilities of project completion of the whole project by the target date are
 - a) 0.4, 0.9 b) 0.45, 0.5
 - c) 0.5, 0.45 d) 0.9, 0.4
- 10) The concept of milestones on a project is relevant for _____
 - a) A-O-N networks b) A-O-A networks
 - c) Precedence Networks d)
 - d) None of the above
- 11) The best technique for handling consumable resources in a project is _____.
 - a) Time/cost tradeoffs
- b) Resource leveling
- c) Resource allocation
- d) Resource aggregation
- 12) The process of utililizing activity floats to obtain an acceptable resource usage profile without increasing project duration is called _____.
 - a) resource aggregation
- b) resource planning
- c) resource leveling d)
 - d) resource allocation
- 13) The process of obtaining a minimum duration project schedule for a given set of resources is referred to as _____.
 - a) resource aggregation
- b) critical path scheduling
- c) resource leveling d)
- d) resource allocation
- 14) If the activity time-cost tradeoffs are linear, the project cost duration efficient frontier is _____.
 - a) linear
 - c) piecewise linear concave
- b) piecewise linear convex
- d) non-linear

Set

Q

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – II

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 is compulsory.

2) Answer any two question out of Q.3 to Q.5

3) Answer any two questions out of Q.7 to Q.9

- 4) Figure to right indicate full marks.
- 5) Assume suitable data only if required but mention it clearly.
- 6) Use of only on programmable calculator is allowed.
- 7) Draw sketches wherever necessary.

Section – I

- Q.2 a) Explain the Steps in Project Management.
 - b) What is Fulkerson's Rule? Using the details shown below, Draw the CPM
 AOA network and do event numbering. Show critical Path and calculate
 Project duration.

Activity		Duration	Preceding
	Activity	(days)	Activity
Α.	Site selection	7	
В.	Digging well	3	А
C.	Laying field channels	15	В
D.	Procurement of Pump	7	А
E.	Installation of pump	3	D, B
F.	Test run	2	C, E

Q.3 Draw Critical Path and Project Duration. Assuming the activities are scheduled on the Earliest Start Time (EST) calculate the manpower requirement for the project with Histograph.

Activity		Duration	Preceding	Manpower/day
	-	(days)	ACLIVILY	
Α.	Land preparation	3		4
В.	Digging pits	5	A	4
С.	Purchase saplings	3	A	2
D.	Application of FYM	3	В	3
Ε.	Transplants saplings	4	C,D	4

Max. Marks: 56

Q.4 For the project with data given in Table 2

- Develop the A-O-A network a)
- Under standard PERT assumptions determine the critical path b)

l able 2		
Job	Predecessors	Duration (a,m,b)
А		2,5,8
В		2,2,14
С	A	3,6,9
D	A	2,8,14
Е	A	2,8,14
F	B,C	3,6,15
G	D,F	6,15,24
Н	D,F	1,4,7
I	E,H	1,7,13

Q.5	a)	Explain the views available in MS Project software.	04
	b)	Explain Role of information in decision making.	04

Explain Role of information in decision making. b)

Section – II

- Q.6 a) What is cash flow diagram? Explain in details with example. 04 Maintenance cost for new bridge with an expected 50 years life was 06 b) estimated to be Rs.10000 each year for the first five years followed by a Rs.100000 expenditure in the 15th year and Rs.100000 expenditure in 30th year. If i = 10% per year, what is the equivalent uniform annual cost over the entire 50 year period? Q.7 a) Which are the various types of Single Payment factor? Explain any one of 05 them. b) A father, on the day his son is born, wishes to determine what amount 04 would have to be paid into an account now bearing interest at 12% compounded quarterly to provide payment of Rs.100000 on his sons 20th birthday? Assist him to determine. Q.8 A project proposed for a new building involves capital investment of 04 a) Rs.100000. It has salvage value of Rs. 20000 and annual receipts is Rs. 32200 & O&M cost is Rs. 22300. What is the internal rate of return, if the life of building is 12 years? What is time value of money? 05 b) Q.9 Write short notes. 09
 - a) Value engineering
 - BOT b)
 - c) Effective and Nominal interest rate

SLR-FM-55

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering ENGINEERING MANAGEMENT – II

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1)	Q. No. 1 is compulsory and it should be solved in first 30 minutes in
	answer book.
2)	Figure to right indicate full marks.
3)	Assume suitable data only if required but mention it clearly.
4)	Use of only on programmable calculator is allowed.
5)	Draw sketches wherever necessary.
,	-

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) The process of utililizing activity floats to obtain an acceptable resource usage profile without increasing project duration is called _____
 - a) resource aggregation c) resource leveling
 - resource planning b) resource allocation d)
 - 2) The process of obtaining a minimum duration project schedule for a given set of resources is referred to as
 - a) resource aggregation c) resource leveling
- b) critical path scheduling d) resource allocation
- If the activity time-cost tradeoffs are linear, the project cost duration 3) efficient frontier is _____.
 - a) linear

c) piecewise linear concave

- b) piecewise linear convex
- d) non-linear
- In recurring deposit scheme _____ factor will be used. 4)
 - a) USCRF USPWF b)
 - c) USSFF d) None
- Bank is interested to apply interest rate compounded ______ to the 5) customer.
 - a) Daily b) Monthly c) Quarterly d) Annually
- 15% rate per year compounded monthly is _____ type of interest rate. 6)
 - a) Nominal Effective b)
 - c) Simple d) None of these
- 7) The uniform amount to be invested at the end of each period in order to produce a fixed amount can be calculated using factor.
 - a) USCAF USCRF b)
 - c) USPWF d) USSFF
- 8) The method which has basis to return as the results of dividing the capital invested by the annual net profit is _____
 - a) Yield method
 - c) PW method

- b) Payback method
- d) EUAC method



Marks: 14

14

R

- 9) Annuity means _____.
 - a) Payments of equal amount
 - b) A series of payment
 - c) equal payment at equal time interval
 - d) b and c
- 10) Engineering Economics analysis is a method for _____.
 - a) Cost analysis of various project alternatives
 - b) Calculating duration of the project
 - c) Doing the sensitivity analysis
 - d) None of these
- 11) If activities in a network cannot be topologically ordered it indicates that _____.
 - a) there is a redundancy in the project
 - b) precedence relations are consistent
 - c) a proper acyclic network cannot be drawn
 - d) None of the above
- 12) A project with uncertain activity times has 2 parallel paths which have probabilities of 0.5 and 0.9 of being completed by the target date. The PERT and actual probabilities of project completion of the whole project by the target date are _____.
 - a) 0.4, 0.9 b) 0.45, 0.5
 - c) 0.5, 0.45 d) 0.9, 0.4
- 13) The concept of milestones on a project is relevant for _____.
 - a) A-O-N networks
- b) A-O-A networks

- c) Precedence Networks
- d) None of the above
- 14) The best technique for handling consumable resources in a project is ____.
 - a) Time/cost tradeoffs
- b) Resource leveling
- c) Resource allocation
- d) Resource aggregation
Set

R

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – II

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 is compulsory.

2) Answer any two question out of Q.3 to Q.5

3) Answer any two questions out of Q.7 to Q.9

- 4) Figure to right indicate full marks.
- 5) Assume suitable data only if required but mention it clearly.
- 6) Use of only on programmable calculator is allowed.
- 7) Draw sketches wherever necessary.

Section – I

- **Q.2 a)** Explain the Steps in Project Management.
 - b) What is Fulkerson's Rule? Using the details shown below, Draw the CPM
 AOA network and do event numbering. Show critical Path and calculate
 Project duration.

	Activity	Duration (days)	Preceding Activity
Α.	Site selection	7	
В.	Digging well	3	А
C.	Laying field channels	15	В
D.	Procurement of Pump	7	А
E.	Installation of pump	3	D, B
F.	Test run	2	C, E

Q.3 Draw Critical Path and Project Duration. Assuming the activities are scheduled on the Earliest Start Time (EST) calculate the manpower requirement for the project with Histograph.

Activity		Duration	Preceding	Manpower/day
	, tourny	(days)	Activity	
Α.	Land preparation	3		4
В.	Digging pits	5	A	4
С.	Purchase saplings	3	A	2
D.	Application of FYM	3	В	3
Ε.	Transplants saplings	4	C,D	4

Max. Marks: 56

Q.4 For the project with data given in Table 2

a) Develop the A-O-A network

Table 2

b) Under standard PERT assumptions determine the critical path

Job	Predecessors	Duration (a,m,b)
Α		2,5,8
В		2,2,14
С	А	3,6,9
D	А	2,8,14
E	A	2,8,14
F	B,C	3,6,15
G	D,F	6,15,24
Н	D,F	1,4,7
I	E,H	1,7,13

Q.5 a) Explain the views available in MS Project software.

b) Explain Role of information in decision making.

Section – II

- Q.6 a) What is cash flow diagram? Explain in details with example. 04 Maintenance cost for new bridge with an expected 50 years life was 06 b) estimated to be Rs.10000 each year for the first five years followed by a Rs.100000 expenditure in the 15th year and Rs.100000 expenditure in 30th year. If i = 10% per year, what is the equivalent uniform annual cost over the entire 50 year period? Q.7 a) Which are the various types of Single Payment factor? Explain any one of 05 them. b) A father, on the day his son is born, wishes to determine what amount 04 would have to be paid into an account now bearing interest at 12% compounded quarterly to provide payment of Rs.100000 on his sons 20th birthday? Assist him to determine. Q.8 A project proposed for a new building involves capital investment of 04 a) Rs.100000. It has salvage value of Rs. 20000 and annual receipts is Rs. 32200 & O&M cost is Rs. 22300. What is the internal rate of return, if the life of building is 12 years? What is time value of money? 05 b) Q.9 Write short notes. 09
 - a) Value engineering
 - b) BOT
 - c) Effective and Nominal interest rate

08

04

04



Set

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

ENGINEERING MANAGEMENT – II Day & Date: Tuesday, 26-11-2019

Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.

- 2) Figure to right indicate full marks.
- 3) Assume suitable data only if required but mention it clearly.
- 4) Use of only on programmable calculator is allowed.
- 5) Draw sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) 15% rate per year compounded monthly is _____ type of interest rate. a) Nominal
 - Effective b)

EUAC method

- c) Simple d) None of these
- 2) The uniform amount to be invested at the end of each period in order to produce a fixed amount can be calculated using factor.
 - a) USCAF USCRF b)
 - c) USPWF d) USSFF
- 3) The method which has basis to return as the results of dividing the capital invested by the annual net profit is _ b) Payback method

d)

- a) Yield method
- c) PW method
- 4) Annuity means _____
 - Payments of equal amount a)
 - b) A series of payment
 - c) equal payment at equal time interval
 - d) b and c
- 5) Engineering Economics analysis is a method for _____.
 - a) Cost analysis of various project alternatives
 - Calculating duration of the project b)
 - c) Doing the sensitivity analysis
 - d) None of these
- 6) If activities in a network cannot be topologically ordered it indicates that _____.
 - a) there is a redundancy in the project
 - b) precedence relations are consistent
 - a proper acyclic network cannot be drawn c)
 - d) None of the above

SLR-FM-55



Set

Max. Marks: 70

Marks: 14

Set 7) A project with uncertain activity times has 2 parallel paths which have probabilities of 0.5 and 0.9 of being completed by the target date. The PERT and actual probabilities of project completion of the whole project by the target date are 0.45, 0.5 b) a) 0.4, 0.9 0.9, 0.4 c) 0.5, 0.45 d) 8) The concept of milestones on a project is relevant for _____ a) A-O-N networks b) A-O-A networks c) Precedence Networks d) None of the above The best technique for handling consumable resources in a project is ____. 9) a) Time/cost tradeoffs **Resource** leveling b) c) Resource allocation d) **Resource** aggregation The process of utililizing activity floats to obtain an acceptable resource 10) usage profile without increasing project duration is called _____ a) resource aggregation resource planning b) c) resource leveling d) resource allocation 11) The process of obtaining a minimum duration project schedule for a given set of resources is referred to as _ a) resource aggregation b) critical path scheduling c) resource leveling d) resource allocation If the activity time-cost tradeoffs are linear, the project cost duration 12) efficient frontier is _____. a) linear b) piecewise linear convex c) piecewise linear concave d) non-linear In recurring deposit scheme _____ factor will be used. 13) a) USCRF USPWF b) c) USSFF d) None 14) Bank is interested to apply interest rate compounded ______ to the customer. a) Daily b) Monthly c) Quarterly d) Annually

SLR-FM-55

Set

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT – II

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 is compulsory.

2) Answer any two question out of Q.3 to Q.5

3) Answer any two questions out of Q.7 to Q.9

- 4) Figure to right indicate full marks.
- 5) Assume suitable data only if required but mention it clearly.
- 6) Use of only on programmable calculator is allowed.
- 7) Draw sketches wherever necessary.

Section – I

- **Q.2 a)** Explain the Steps in Project Management.
 - b) What is Fulkerson's Rule? Using the details shown below, Draw the CPM
 AOA network and do event numbering. Show critical Path and calculate
 Project duration.

	Activity	Duration	Preceding
	Activity	(days)	Activity
Α.	Site selection	7	
Β.	Digging well	3	А
C.	Laying field channels	15	В
D.	Procurement of Pump	7	A
E.	Installation of pump	3	D, B
F.	Test run	2	C, E

Q.3 Draw Critical Path and Project Duration. Assuming the activities are scheduled on the Earliest Start Time (EST) calculate the manpower requirement for the project with Histograph.

	Activity	Duration	Preceding	Manpower/day
	-	(days)	ACLIVILY	
Α.	Land preparation	3		4
В.	Digging pits	5	A	4
C.	Purchase saplings	3	A	2
D.	Application of FYM	3	В	3
Ε.	Transplants saplings	4	C,D	4

Max. Marks: 56

Q.4 For the project with data given in Table 2

a) Develop the A-O-A network

Table 2

b) Under standard PERT assumptions determine the critical path

Job	Predecessors	Duration (a,m,b)
А		2,5,8
В		2,2,14
С	А	3,6,9
D	А	2,8,14
E	A	2,8,14
F	B,C	3,6,15
G	D,F	6,15,24
Н	D,F	1,4,7
I	E,H	1,7,13

Q.5 a) Explain the views available in MS Project software.

b) Explain Role of information in decision making.

Section – II

- Q.6 a) What is cash flow diagram? Explain in details with example. 04 Maintenance cost for new bridge with an expected 50 years life was 06 b) estimated to be Rs.10000 each year for the first five years followed by a Rs.100000 expenditure in the 15th year and Rs.100000 expenditure in 30th year. If i = 10% per year, what is the equivalent uniform annual cost over the entire 50 year period? Q.7 a) Which are the various types of Single Payment factor? Explain any one of 05 them. b) A father, on the day his son is born, wishes to determine what amount 04 would have to be paid into an account now bearing interest at 12% compounded quarterly to provide payment of Rs.100000 on his sons 20th birthday? Assist him to determine. Q.8 A project proposed for a new building involves capital investment of 04 a) Rs.100000. It has salvage value of Rs. 20000 and annual receipts is Rs. 32200 & O&M cost is Rs. 22300. What is the internal rate of return, if the life of building is 12 years? What is time value of money? 05 b) Q.9 Write short notes. 09 a) Value engineering
 - b) BOT
 - c) Effective and Nominal interest rate

08

04

04



Set

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – II**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data wherever needed & mention it.

- 2) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20
 - Check rails are provided on the curves to 1)
 - Reduce the lateral wear on outer rail a)
 - Prevent the outer wheel flange from mounting the outer rail b)
 - Prevent the vehicles from derailment C)
 - d) All the above
 - 2) Coning of wheels prevents _____.
 - Rubbing the inside face of the rail head a)
 - Lateral movement of the axle with its wheels b)
 - Both (a) and (b) c)
 - None the above d)
 - 3) The Signal which is provided next to Warner signal on the station yard is _____.
 - Inner signal a)

- c) Home signal
- The longitudinal movement of rails in a track is called as _____. 4)
 - Creep of rails a)
 - Hugging of rails C)
- 5) When the crossing is seen standing at the toe of switch, the direction is called as _____. b) Backing direction
 - a) Facing direction
 - Reserve direction d) None c)
- 6) When the Railway line and road cross each other at the same level, it is called as . b) Railway crossing
 - a) Road crossing c) Level crossing
- The maximum rising gradient which is provided keeping in view the power, 7) of locomotive is
 - Exceptional gradient a) Rising gradient

c)

b) Ruling gradient

d) None

- d) None
- Runway threshold is indicated by a series of parallel lines starting from a 8) distance of _____.
 - 3 m from runway end a)
 - 10 m from runway end c)
- b) 6 m from runway end
- d) 15 m from runway end

Max. Marks: 100

Marks: 20

Set

Seat No.

- b) Check of rails
- d) None

- b) Outer signal

- d) None

Set P 9) For supersonic aircraft, the minimum turning radius of taxiway is _____. b) 120m 60m a) c) 180m d) 240m 10) The runway length after correcting the elevation and temperature is 2845m. If the effective gradient on runway is 0.5 percent then the revised runway length will be _____. a) 2845 m b) 2910 m 3030 m d) 3130 m c) 11) The construction in the form of a cluster of closely spaced piles is known as ___ Dolphins b) Piers a) c) Wharf d) Jetty The permissible cross wind component does not exceed _____. 12) a) 35 kmph b) 25 kmph d) 40 kmph c) 20 kmph Gauge width for N.G. Track is ____ 13) b) a) 1.67 m 1 m c) .762 m d) None 14) Which of the following is used for servicing and repair of aircraft? b) terminal building Apron a) C) holding apron d) hanger 15) According to ICAO, all marking on runways are. a) white b) black C) vellow d) green 16) Calm period is the percentage of time during which wind intensity is less than _____. a) 4.8 kmph b) 6.4 kmph d) 9.6 kmph c) 8 kmph 17) The minimum width of clearway is b) 100m a) 50m d) 250m c) 150m Usually jetties are constructed ____ 18) Perpendicular to the shore b) Parallel to the shore a) c) Skew to the shore d) Both a) and b) 19) Buoys which support the cables to which vessels are attached are of . cylindrical shape b) drum a) C) pear shaped d) all of these If F is the fetch, the straight line distance of open water available in 20) kilometers, the height of the wave in meters is _ a) 0.15 F b) 0.20 F 0.28 F d) 0.34 F c)

SLR-FM-56

Seat No. T.E. (Dort. II) (Old) ((

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – II

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever needed & mention it.

Section – I

Q.2 Answer any there of the following questions.

- a) What do you understand by a railway track or a permanent way? Mention the requirements of an ideal permanent way.
- b) Discuss the necessity and effects of coning of wheels.
- c) Compare the characteristics of the different types of sleepers used in our country.
- d) A locomotive as shown in fig. 2-1 is required to haul a train at 80 km p.h. The axle load of the driving wheels of the engine is 22.50 tonnes. The train is to run on a straight level track. Find the maximum permissible train load that the engine can pull.

If the train climbs a gradient of 1 in 200. how much of the speed should be reduced?

2-8-2 Locomotive



- b) Calculate the lead and radius of a 1 in 8.5 BG turnout for 90R rails using Cole's method. Assume G=1.676m, d=120mm, α =6°42'35".
- c) Briefly describe the locations and purposes of the following signals.
 - 1) Warner
 - 2) Outer

Q.3

- 3) Home
- 4) Starter
- 5) Advance starter

Max. Marks: 80

24

SLR-FM-56

Section – II

Q.4 Answer any three of the following questions.

- a) What are the factors to be considered while selecting site for airport.
- b) Draw cross-section of runway showing all component parts and explain it in detail.
- c) At an airport site at sea level with standard atmospheric conditions, the runway lengths required for take-off and landing are 2000 m and 2400m respectively. The proposed airport is situated at an altitude of 150m. If the airport reference temperature is 25^oC and the effective runway gradient is 0.35 percent, calculate the length of runway to be provided.
- d) Write a short note on wind rose diagram with neat sketch.

Q.5 Answer any two of the following questions.

- a) Define harbour? List different classes of harbour, explain any one with neat sketch.
- b) What are fenders? Why are they used? Describe various types of fenders with sketches.
- c) Why it is necessary to provide facilities like aprons, transit sheds and warehouses at the ports.

24

16

SLR-FM-56 Set P

Seat				
No.				
	T.E. (Part – I) (Old)	(CGPA)) Ex

xamination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – II**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data wherever needed & mention it.

2) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

d) None

3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

as

Choose the correct alternatives from the options and rewrite the sentence. 20 Q.1

- When the Railway line and road cross each other at the same level, it is 1) called as
 - Road crossing a)
 - c) Level crossing
- 2) The maximum rising gradient which is provided keeping in view the power, of locomotive is ____

Exceptional gradient a)

- b) Ruling gradient **Rising gradient** d) None c)
- Runway threshold is indicated by a series of parallel lines starting from a 3) distance of _____.
 - a) 3 m from runway end
- b) 6 m from runway end
- d) 15 m from runway end 10 m from runway end

b) Railway crossing

- For supersonic aircraft, the minimum turning radius of taxiway is _____. 4) 60m b) 120m a)
 - c) 180m d) 240m
- The runway length after correcting the elevation and temperature is 5) 2845m. If the effective gradient on runway is 0.5 percent then the revised runway length will be .

a)	2845 m	b)	2910 m
c)	3030 m	d)	3130 m

The construction in the form of a cluster of closely spaced piles is known 6)

a)	Dolphins	b)	Piers

- c) Wharf d) Jetty
- The permissible cross wind component does not exceed . 7)
 - 35 kmph b) 25 kmph a)
 - c) 20 kmph d) 40 kmph

Gauge width for N.G. Track is ____ 8)

- b) a) 1.67 m 1 m
- .762 m c) d) None



Max. Marks: 100

Marks: 20

				Set	Q
9)	Whicł a) A c) h	n of the following is used for se Apron holding apron	rvicii b) d)	ng and repair of aircraft? terminal building hanger	
10)	Accor a) V c) Y	ding to ICAO, all marking on ru Vhite ⁄ellow	inwa b) d)	ays are. black green	
11)	Calm than _ a) 4 c) 8	period is the percentage of tim I.8 kmph 8 kmph	e du b) d)	rring which wind intensity is less 6.4 kmph 9.6 kmph	
12)	The n a) 5 c) 1	ninimum width of clearway is 50m 50m	b) d)	 100m 250m	
13)	Usual a) F c) S	Ily jetties are constructed Perpendicular to the shore Skew to the shore	b) d)	Parallel to the shore Both a) and b)	
14)	Buoys a) c c) p	s which support the cables to w ylindrical shape bear shaped	hich b) d)	vessels are attached are of drum all of these	
15)	lf F is kilom a) C c) C	the fetch, the straight line dista eters, the height of the wave in 0.15 F 0.28 F	ance met b) d)	of open water available in ers is 0.20 F 0.34 F	
16)	Checl a) F b) F c) F d) A	k rails are provided on the curv Reduce the lateral wear on oute Prevent the outer wheel flange f Prevent the vehicles from derail All the above	es to er rai from men	o il mounting the outer rail it	
17)	Conin a) F b) L c) E d) N	ng of wheels prevents Rubbing the inside face of the ra ateral movement of the axle with Both (a) and (b) None the above	ail he	ead s wheels	
18)	The S is a) li c) H	Signal which is provided next to nner signal lome signal	Wa b) d)	rner signal on the station yard Outer signal None	
19)	The lo a) C c) F	ongitudinal movement of rails ir Creep of rails lugging of rails	n a tr b) d)	ack is called as Check of rails None	
20)	When called a) F c) F	the crossing is seen standing as Facing direction Reserve direction	at th b) d)	e toe of switch, the direction is Backing direction None	

Seat No. T.E. (Part – II) (Old) (C

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – II

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever needed & mention it.

Section – I

Q.2 Answer any there of the following questions.

- a) What do you understand by a railway track or a permanent way? Mention the requirements of an ideal permanent way.
- b) Discuss the necessity and effects of coning of wheels.
- c) Compare the characteristics of the different types of sleepers used in our country.
- d) A locomotive as shown in fig. 2-1 is required to haul a train at 80 km p.h. The axle load of the driving wheels of the engine is 22.50 tonnes. The train is to run on a straight level track. Find the maximum permissible train load that the engine can pull.

If the train climbs a gradient of 1 in 200. how much of the speed should be reduced?

2-8-2 Locomotive



- b) Calculate the lead and radius of a 1 in 8.5 BG turnout for 90R rails using Cole's method. Assume G=1.676m, d=120mm, α =6°42'35".
- c) Briefly describe the locations and purposes of the following signals.
 - 1) Warner
 - 2) Outer

Q.3

- 3) Home
- 4) Starter
- 5) Advance starter

Max. Marks: 80

24

SLR-FM-56

Section – II

Q.4 Answer any three of the following questions.

- a) What are the factors to be considered while selecting site for airport.
- b) Draw cross-section of runway showing all component parts and explain it in detail.
- c) At an airport site at sea level with standard atmospheric conditions, the runway lengths required for take-off and landing are 2000 m and 2400m respectively. The proposed airport is situated at an altitude of 150m. If the airport reference temperature is 25^oC and the effective runway gradient is 0.35 percent, calculate the length of runway to be provided.
- d) Write a short note on wind rose diagram with neat sketch.

Q.5 Answer any two of the following questions.

- a) Define harbour? List different classes of harbour, explain any one with neat sketch.
- b) What are fenders? Why are they used? Describe various types of fenders with sketches.
- c) Why it is necessary to provide facilities like aprons, transit sheds and warehouses at the ports.

24

16

SLR-FM-56 Set Q

Seat No.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – II**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data wherever needed & mention it.

- 2) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

20

Choose the correct alternatives from the options and rewrite the sentence. Q.1 20

The construction in the form of a cluster of closely spaced piles is known 1)

us _	•		
a)	Dolphins	b)	Piers

C) Wharf d) Jetty

2) The permissible cross wind component does not exceed _____.

35 kmph b) 25 kmph a)

- 40 kmph 20 kmph d) c)
- 3) Gauge width for N.G. Track is _____
 - a) 1.67 m b) 1 m .762 m d) None C)
- 4) Which of the following is used for servicing and repair of aircraft?
 - a) Apron b) terminal building
 - c) holding apron d) hanger
- 5) According to ICAO, all marking on runways are.
 - white a) b) black
 - yellow d) green C)

Calm period is the percentage of time during which wind intensity is less 6) than _____.

a)	4.8 kmph	b)) 6.4 kmph
c)	8 kmph	d)) 9.6 kmph

7)	The minimum width of clearway is		
	a) = 50m	h)	100~

a)	50m	D)	100m
C)	150m	d)	250m

- 8) Usually jetties are constructed ____
 - a) Perpendicular to the shore b) Parallel to the shore
 - c) Skew to the shore d) Both a) and b)
- Buoys which support the cables to which vessels are attached are of _____. 9) a)
 - cylindrical shape b) drum
 - pear shaped d) all of these c)



Max. Marks: 100

Marks: 20

- 10) If F is the fetch, the straight line distance of open water available in kilometers, the height of the wave in meters is _____
 - 0.15 F b) 0.20 F
 - 0.28 F d) 0.34 F c)
- 11) Check rails are provided on the curves to .
 - Reduce the lateral wear on outer rail a)
 - b) Prevent the outer wheel flange from mounting the outer rail
 - c) Prevent the vehicles from derailment
 - d) All the above

a)

- Coning of wheels prevents _____. 12)
 - a) Rubbing the inside face of the rail head
 - Lateral movement of the axle with its wheels b)
 - c) Both (a) and (b)
 - d) None the above

The Signal which is provided next to Warner signal on the station yard 13) is

Inner signal a)

a) Creep of rails

c)

- c) Home signal
- b) Outer signal
- d) None
- The longitudinal movement of rails in a track is called as . 14)
 - b) Check of rails
 - c) Hugging of rails d) None
- 15) When the crossing is seen standing at the toe of switch, the direction is called as _____.
 - a) Facing direction Reserve direction
- b) Backing direction d) None
- When the Railway line and road cross each other at the same level, it is 16) called as .
 - a) Road crossing c) Level crossing a) Road crossing
- b) Railway crossing
- d) None
- The maximum rising gradient which is provided keeping in view the power, 17) of locomotive is
 - a) Exceptional gradient

c) Rising gradient

- b) Ruling gradient d) None
- Runway threshold is indicated by a series of parallel lines starting from a 18) distance of _____.
 - 3 m from runway end a) c) 10 m from runway end
- b) 6 m from runway end
- d) 15 m from runway end
- For supersonic aircraft, the minimum turning radius of taxiway is _____. 19)
 - a) 60m b) 120m
 - 180m d) 240m c)
- The runway length after correcting the elevation and temperature is 20) 2845m. If the effective gradient on runway is 0.5 percent then the revised runway length will be _____.
 - a) 2845 m b) 2910 m
 - d) 3130 m c) 3030 m

SLR-FM-56

Set | R

Seat No.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – II

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever needed & mention it.

Section – I

Q.2 Answer any there of the following questions.

- a) What do you understand by a railway track or a permanent way? Mention the requirements of an ideal permanent way.
- b) Discuss the necessity and effects of coning of wheels.
- c) Compare the characteristics of the different types of sleepers used in our country.
- d) A locomotive as shown in fig. 2-1 is required to haul a train at 80 km p.h. The axle load of the driving wheels of the engine is 22.50 tonnes. The train is to run on a straight level track. Find the maximum permissible train load that the engine can pull.

If the train climbs a gradient of 1 in 200. how much of the speed should be reduced?

2-8-2 Locomotive



- b) Calculate the lead and radius of a 1 in 8.5 BG turnout for 90R rails using Cole's method. Assume G=1.676m, d=120mm, α =6°42'35".
- c) Briefly describe the locations and purposes of the following signals.
 - 1) Warner
 - 2) Outer
 - 3) Home
 - 4) Starter
 - 5) Advance starter

Max. Marks: 80

24

SLR-FM-56

Section – II

Q.4 Answer any three of the following questions.

- a) What are the factors to be considered while selecting site for airport.
- b) Draw cross-section of runway showing all component parts and explain it in detail.
- c) At an airport site at sea level with standard atmospheric conditions, the runway lengths required for take-off and landing are 2000 m and 2400m respectively. The proposed airport is situated at an altitude of 150m. If the airport reference temperature is 25^oC and the effective runway gradient is 0.35 percent, calculate the length of runway to be provided.
- d) Write a short note on wind rose diagram with neat sketch.

Q.5 Answer any two of the following questions.

- a) Define harbour? List different classes of harbour, explain any one with neat sketch.
- b) What are fenders? Why are they used? Describe various types of fenders with sketches.
- c) Why it is necessary to provide facilities like aprons, transit sheds and warehouses at the ports.

24

16

SLR-FM-56 Set R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – II

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Assume suitable data wherever needed & mention it.

- 2) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

1) Calm period is the percentage of time during which wind intensity is less than _____.

a)	4.8 kmph	b)	6.4 kmph
``		1)	

- c) 8 kmph d) 9.6 kmph
- 2) The minimum width of clearway is _____.
 a) 50m
 b) 100m
 - c) 150m d) 250m
- 3) Usually jetties are constructed _____.
 - a) Perpendicular to the shore b) Parallel to the shore
 - c) Skew to the shore d) Both a) and b)
- 4) Buoys which support the cables to which vessels are attached are of _____.
 - a) cylindrical shape b) drum
 - c) pear shaped d) all of these
- 5) If F is the fetch, the straight line distance of open water available in kilometers, the height of the wave in meters is _____.
 - a) 0.15 F b) 0.20 F
 - c) 0.28 F d) 0.34 F
- Check rails are provided on the curves to _____.
 - a) Reduce the lateral wear on outer rail
 - b) Prevent the outer wheel flange from mounting the outer rail
 - c) Prevent the vehicles from derailment
 - d) All the above
- 7) Coning of wheels prevents _____
 - a) Rubbing the inside face of the rail head
 - b) Lateral movement of the axle with its wheels
 - c) Both (a) and (b)
 - d) None the above
- The Signal which is provided next to Warner signal on the station yard is _____.
 - a) Inner signal
 - c) Home signal

- b) Outer signal
- d) None

Set S

Max. Marks: 100

Marks: 20

			SLR-FM-56
			Set S
9)	The longitudinal movement of railsa) Creep of railsc) Hugging of rails	in a t b) d)	rack is called as Check of rails None
10)	 When the crossing is seen standing called as a) Facing direction c) Reserve direction 	g at tl b) d)	ne toe of switch, the direction is Backing direction None
11)	When the Railway line and road crocalled asa) Road crossingc) Level crossing	bss e b) d)	ach other at the same level, it is Railway crossing None
12)	The maximum rising gradient which of locomotive is a) Exceptional gradient c) Rising gradient	n is p b) d)	rovided keeping in view the power, Ruling gradient None
13)	Runway threshold is indicated by a distance of a) 3 m from runway end c) 10 m from runway end	serie b) d)	es of parallel lines starting from a 6 m from runway end 15 m from runway end
14)	For supersonic aircraft, the minimu a) 60m c) 180m	m tur b) d)	ning radius of taxiway is 120m 240m
15)	The runway length after correcting 2845m. If the effective gradient on runway length will be a) 2845 m c) 3030 m	the e runw b) d)	levation and temperature is ay is 0.5 percent then the revised 2910 m 3130 m
16)	The construction in the form of a cle as a) Dolphins c) Wharf	uster b) d)	of closely spaced piles is known Piers Jetty
17)	The permissible cross wind compore a) 35 kmph c) 20 kmph	nent b) d)	does not exceed 25 kmph 40 kmph
18)	Gauge width for N.G. Track is a) 1.67 m c) .762 m	 b) d)	1 m None
19)	Which of the following is used for s a) Apron c) holding apron	ervici b) d)	ing and repair of aircraft? terminal building hanger
20)	According to ICAO, all marking on a) white c) yellow	runwa b) d)	ays are. black green

Seat No.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – II

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever needed & mention it.

Section – I

Q.2 Answer any there of the following questions.

- a) What do you understand by a railway track or a permanent way? Mention the requirements of an ideal permanent way.
- b) Discuss the necessity and effects of coning of wheels.
- c) Compare the characteristics of the different types of sleepers used in our country.
- d) A locomotive as shown in fig. 2-1 is required to haul a train at 80 km p.h. The axle load of the driving wheels of the engine is 22.50 tonnes. The train is to run on a straight level track. Find the maximum permissible train load that the engine can pull.

If the train climbs a gradient of 1 in 200. how much of the speed should be reduced?

2-8-2 Locomotive



- b) Calculate the lead and radius of a 1 in 8.5 BG turnout for 90R rails using Cole's method. Assume G=1.676m, d=120mm, α =6°42'35".
- c) Briefly describe the locations and purposes of the following signals.
 - 1) Warner
 - 2) Outer

Q.3

- 3) Home
- 4) Starter
- 5) Advance starter

Max. Marks: 80

24

SLR-FM-56

Section – II

Q.4 Answer any three of the following questions.

- a) What are the factors to be considered while selecting site for airport.
- b) Draw cross-section of runway showing all component parts and explain it in detail.
- c) At an airport site at sea level with standard atmospheric conditions, the runway lengths required for take-off and landing are 2000 m and 2400m respectively. The proposed airport is situated at an altitude of 150m. If the airport reference temperature is 25^oC and the effective runway gradient is 0.35 percent, calculate the length of runway to be provided.
- d) Write a short note on wind rose diagram with neat sketch.

Q.5 Answer any two of the following questions.

- a) Define harbour? List different classes of harbour, explain any one with neat sketch.
- b) What are fenders? Why are they used? Describe various types of fenders with sketches.
- c) Why it is necessary to provide facilities like aprons, transit sheds and warehouses at the ports.

24

16

SLR-FM-56 Set S

Set

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Softening point of bitumen to be used for road construction at a place where maximum temperature is 40° should be _
 - a) Less than 40° c) Equal to 40°
- d) None of these
- 2) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - a) Potholes Ravelling b)
 - c) Edge breaking d) Rutting
- Critical combination of stresses for corner region in cement concrete road 3) is
 - a) Load stress + warping stress frictional stress
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress
- In highway construction, rolling starts from _____. 4)
 - a) Sides and proceed to centre
 - b) Centre and proceed to sides
 - c) One side and proceed to other side
 - d) Any of the above
- 5) When the bituminous surfacing is done on already existing black top road, the type of treatment to be given is
 - a) Seal coat Tack coat b) c) Prime coat d) Fog seal
- The maximum spacing of contraction joints in rigid pavements is, _____. 6)
 - a) 2.5m b) 3.5m
 - c) 4.5m d) 5.5m
- 7) Maximum thickness of expansion joint in rigid pavement is _____.
 - a) 10 mm b) 25 mm
 - c) 50 mm d) 100 mm



Max. Marks: 50

Marks: 10

SLR-FM-57

Greater than 40° b)

Page **2** of **16**

8) Match List-I(Test) with List-II(Purpose) and select the correct answer using the codes: _____.

List – I

A) Impact test

1) Bitumen Toughness 2)

3)

4)

- Los Angeles abrasion test B)
- C) Crushing test
- Stripping test D)

Codes:

- В С D Α
- 2 3 4 1 a) 2 3
- b) 4 1 c) 4 3 2 1
- 2 1 4 3 d)

Most suitable material for highway embankment is _____. 9)

- a) Granular soil c) Silty soil
- Organic clay b) d) Clayey soil
- The most suitable equipment for compacting clayey soil is: ____ 10)
 - a) Smooth wheeled roller
 - c) Sheep foot roller
- Pneumatic tyred roller b)
- d) Vibratory roller

Set P

_.

- SLR-FM-57
- List II

Hardness

Strength

Page **3** of **16**

SLR-FM-57

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- a) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- **b)** Explain the importance of:
 - i) Softening Point Test
 - ii) Ductility Test of Bitumen
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- d) The number of commercial vehicles per day at present count is 6000. Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- e) Mention the specifications of materials and construction steps for Wet Mix Macadam.
- f) List the different distresses in flexible pavement. Explain any two distresses with suitable remedial measure.
- **g)** Explain the causes of for mud pumping in CC pavements. Explain how this leads to failure of CC pavement slabs.

Max. Marks: 40

40

Set F

h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-57

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

PAVEMENT ANALYSIS AND DESIGN

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Seat

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) The maximum spacing of contraction joints in rigid pavements is,
 - 2.5m b) 3.5m a)
 - 4.5m d) 5.5m c)
- 2) Maximum thickness of expansion joint in rigid pavement is .
 - 25 mm 10 mm a) b)
 - c) 50 mm d) 100 mm
- Match List-I(Test) with List-II(Purpose) and select the correct answer 3) using the codes: _____.
 - List I A) Impact test
 - B) Los Angeles abrasion test
 - C) Crushing test
 - Stripping test D)
 - Codes:
 - В С Α D 2 3 4 1 a)
 - 2 b) 4 1 3
 - 2 4 3 1 C)
 - 2 4 3 d) 1

4) Most suitable material for highway embankment is

a) Granular soil c) Silty soil

- b) Organic clay d) Clayey soil
- The most suitable equipment for compacting clayey soil is: _ 5)
 - a) Smooth wheeled roller b) Pneumatic tyred roller
 - c) Sheep foot roller
- 6) Softening point of bitumen to be used for road construction at a place where maximum temperature is 40° should be .

d)

- a) Less than 40°
- Greater than 40° b)

Vibratory roller

c) Equal to 40° d) None of these

- Strength

List – II

- 1) Bitumen
- 2) Toughness
- 3) Hardness 4)

No. **Civil Engineering** SLR-FM-57

Max. Marks: 50

Marks: 10

Q



- 7) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - a) Potholes b) Ravelling
 - c) Edge breaking d) Rutting
- Critical combination of stresses for corner region in cement concrete road is _____.
 - a) Load stress + warping stress frictional stress
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress
- 9) In highway construction, rolling starts from _____.
 - a) Sides and proceed to centre
 - b) Centre and proceed to sides
 - c) One side and proceed to other side
 - d) Any of the above
- 10) When the bituminous surfacing is done on already existing black top road, the type of treatment to be given is _____.
 - a) Seal coat
 - c) Prime coat

- b) Tack coat
- d) Fog seal

Page 6 of 16

Page **7** of **16**

SLR-FM-57

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- a) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- **b)** Explain the importance of:
 - i) Softening Point Test
 - ii) Ductility Test of Bitumen
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- d) The number of commercial vehicles per day at present count is 6000. Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- e) Mention the specifications of materials and construction steps for Wet Mix Macadam.
- f) List the different distresses in flexible pavement. Explain any two distresses with suitable remedial measure.
- **g)** Explain the causes of for mud pumping in CC pavements. Explain how this leads to failure of CC pavement slabs.



40

Set Q

h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-57

Set Q

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

a)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Most suitable material for highway embankment is
 - a) Granular soil c) Silty soil
- Organic clay b) d) Clayey soil
- 2) The most suitable equipment for compacting clayey soil is:
 - Pneumatic tyred roller b)

Greater than 40°

- c) Sheep foot roller
- d) Vibratory roller
- Softening point of bitumen to be used for road construction at a place 3) where maximum temperature is 40° should be _____.
 - a) Less than 40°

Smooth wheeled roller

- b) Equal to 40° None of these c) d)
- 4) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - b) a) Potholes Ravelling
 - d) c) Edge breaking Rutting
- Critical combination of stresses for corner region in cement concrete road 5) is
 - a) Load stress + warping stress - frictional stress
 - b) Load stress + warping stress + frictional stress
 - c) Load stress + warping stress
 - d) Load stress + frictional stress
- In highway construction, rolling starts from _____. 6)
 - a) Sides and proceed to centre
 - b) Centre and proceed to sides
 - c) One side and proceed to other side
 - d) Any of the above

When the bituminous surfacing is done on already existing black top 7) road, the type of treatment to be given is _

- a) Seal coat Tack coat b)
- Prime coat d) Fog seal c)

R

Marks: 10

Max. Marks: 50

SLR-FM-57

Set R

- The maximum spacing of contraction joints in rigid pavements is, _____. 8)
 - a) 2.5m b)
- 3.5m
 - c) 4.5m d) 5.5m
- 9) Maximum thickness of expansion joint in rigid pavement is _____.
 - a) 10 mm b) 25 mm c) 50 mm
 - 100 mm d)
- 10) Match List-I(Test) with List-II(Purpose) and select the correct answer using the codes: _____.
 - List I
 - Impact test A)
 - B) Los Angeles abrasion test
 - C) Crushing test
 - Stripping test D)

Codes:

Α В С D 2 4 a) 3 1 2 1 3 b) 4 3 2 4 1 C) 2 4 3 d) 1

- List II
- 1) Bitumen
- 2) Toughness
- Hardness 3)
- 4) Strength

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- a) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- **b)** Explain the importance of:
 - i) Softening Point Test
 - ii) Ductility Test of Bitumen
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- d) The number of commercial vehicles per day at present count is 6000. Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- e) Mention the specifications of materials and construction steps for Wet Mix Macadam.
- f) List the different distresses in flexible pavement. Explain any two distresses with suitable remedial measure.
- **g)** Explain the causes of for mud pumping in CC pavements. Explain how this leads to failure of CC pavement slabs.



R

40

Max. Marks: 40

h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-57

Set R

rage 13 01 10	Page	13	of	16
---------------	------	----	----	----

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Seat

No.

Marks: 10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Critical combination of stresses for corner region in cement concrete road is
 - a) Load stress + warping stress - frictional stress
 - Load stress + warping stress + frictional stress b)
 - c) Load stress + warping stress
 - d) Load stress + frictional stress

2) In highway construction, rolling starts from .

- a) Sides and proceed to centre
- b) Centre and proceed to sides
- c) One side and proceed to other side
- d) Any of the above
- 3) When the bituminous surfacing is done on already existing black top road, the type of treatment to be given is
 - a) Seal coat b) Tack coat
 - Prime coat d) Fog seal c)
- The maximum spacing of contraction joints in rigid pavements is, _____. 4)
 - 2.5m a) b) 3.5m
 - c) 4.5m d) 5.5m
- Maximum thickness of expansion joint in rigid pavement is _____. 5)
 - a) 10 mm c) 50 mm

- 25 mm b) 100 mm
- d)



Set

Max. Marks: 50

 Match List-I(Test) with List-II(Purpose) and select the correct answer using the codes: _____.

List – I

A) Impact test

List – II

Hardness

Strength

SLR-FM-57

Set | S

Bitumen
 Toughness

3)

4)

- B) Los Angeles abrasion test
- C) Crushing test
- D) Stripping test

Codes:

- ABCD
- a) 2 3 4 1
- b) 4 1 2 3
- c) 4 3 2 1 d) 2 1 4 3

7) Most suitable material for highway embankment is _____

- a) Granular soilc) Silty soil
- b) Organic clayd) Clayey soil
- 8) The most suitable equipment for compacting clayey soil is: _
 - a) Smooth wheeled roller
- b) Pneumatic tyred rollerd) Vibratory roller
- c) Sheep foot rollerd) Vibratory rollerSoftening point of bitumen to be used for road construction at a
- Softening point of bitumen to be used for road construction at a place where maximum temperature is 40° should be _____.
 - a) Less than 40°

- b) Greater than 40°
- c) Equal to 40°
- d) None of these
- 10) Which one of the following defects indicates progressive disintegration of bituminous premix carpet surfacing by loss of aggregates, _____.
 - a) Potholes

c)

- b) Ravelling
- Edge breaking
- d) Rutting
| Seat | |
|------|--|
| No | |

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering PAVEMENT ANALYSIS AND DESIGN

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM Max. Marks: 40

40

Instructions: 1) Attempt any five questions from Q. No.2.

- 2) Figures to right indicate full marks.
- 3) Assume suitable data, if required and state it clearly.

Q.2 Answer any five questions.

- a) Discuss the importance of gross wheel load and contact pressure in stress distribution pattern and in pavement design. Illustrate with stress distribution diagram.
- b) Explain the importance of:
 - i) Softening Point Test
 - ii) Ductility Test of Bitumen
- c) Explain various types of joints provided in cement concrete pavement with neat sketches.
- d) The number of commercial vehicles per day at present count is 6000. Design life is 15 years. Traffic growth rate is 8%, VDF is 4.5, lateral distribution factor for 6 lane divided highway is 0.6. Calculate the number of standard axles in the design life if the construction period is 2 years.
- e) Mention the specifications of materials and construction steps for Wet Mix Macadam.
- f) List the different distresses in flexible pavement. Explain any two distresses with suitable remedial measure.
- **g)** Explain the causes of for mud pumping in CC pavements. Explain how this leads to failure of CC pavement slabs.



h) The plate bearing tests were conducted with 30cm plate diameter on soil subgrade and over a base course of thickness 45cm. The pressures yielded at 0.5cm deflection on the subgrade and base course were 1.25kg/cm² and 8.0kg/cm² respectively. Design the pavement section for 5100kg wheel load with tyre pressure of 7kg/cm² for an allowable deflection of 0.5cm using Burmister's two - layer deflection factor chart (Use Figure-1).



SLR-FM-57

Set S

Seat No.						Set	Ρ
		T.E. (Part – II) (Old) (CGPA) E	xami	ination Nov/Dec-2019		
		GEOGVNITUE		neerii	ng		
Dav &	Date	: Thursday. 28-1	1-2019	VCEL	Max.	Marks	s: 50
Time: 1	10:00	AM To 12:00 P	M				
Instruc	ction	s: 1) Q. No.1 is	compulsory and it sh	nould l	be solved in first 20 minutes	s in	
		2) Figures to	right indicate full ma	rks.			
		3) Assume a	dditional data, if requ	ired a	nd state it clearly.		
Duratio	on: 20	Ninutes	ICQ/Objective Ty	/pe C	luestions	Marks	s: 10
Q.1 (Choo	se the correct	alternatives from th	e opt	ions and rewrite the	marrie	10
S	sente	ence.	wath at a frame LIV/ avr	-	is added to it		
ľ)	a) Plastic	synthetic from UV exp	bosure b)	Carbon Black		
		c) Benzene		d)	Cement		
2	2)	The shape of ap	pertures in geonets is	S			
		a) Square		b) d)	Circular Diamond		
3	3)	A planar, polym	eric product consisti	ng of a	a mesh or net-like regular o	pen	
	,	network of inter	secting tensile-resist	ant el	ements, integrally connecte	d at	
		the junctions, is	called	h)	Geogrid		
		c) Geonet		d)	Geocell		
4	I)	The materials u	sed in the manufactu	uring o	of geosynthetics are primari	ly	
		a) Rubber	ers generally derived	d from	 Fiberglass		
		c) Crude petro	oleum oils	d)	Jute		
5	5)	Indian standard	for sampling of geos	synthe	tic specimens is		
		a) IS 800		b)	IS 14706		
6	;)	MEL is acronym	for	u)	15 2700		
U	,	a) Mount flow	Instrument	b)	Money fix Installment		
		c) Metal flow I	ndex	d)	Melt flow Index		
7	7)	The core of GC	L is made of		aamaat		
		c) clay	Jay	d)	timber		
8	3)	Which of the fol	lowing tests measure	es the	toughness of road aggrega	ates?	
		a) Crushing st	rength test	b)	Abrasion test		
Q)	The sum of flak	iness index and elon	u) natior	index should not exceed		
	•)	a) 15		b)	20		
		c) 30		d)	40		
1	0)	The width of gri a) 25 mm	ps for performing the	grab b)	tensile strength is, 10 mm	_•	

ſ

c) 15 mm d) 35 mm

SLR-FM-58

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-58

Max. Marks: 40

Set P

Seat No.				Se	et	Q
	T.E. (Part –		Exam	ination Nov/Dec-2019	L	
	GEOSVNTH	Civil Engi	neeri RCFI	ng SOU STRUCTURES		
Day &	Date: Thursday, 28	-11-2019		Max. Ma	arks	s: 50
Instruc	tions: 1) Q. No.1 i:	s compulsory and it s	hould	be solved in first 20 minutes in		
	answer bo	ook.				
	2) Figures to 3) Assume a	additional data, if req	arks. uired a	nd state it clearly.		
		MCQ/Objective T	уре С	Questions		
Duratio	n: 20 Minutes			Ma	arks	3: 10
Q.1 (choose the correct sentence.	alternatives from t	he opt	ions and rewrite the		10
1) MFI is acronyr a) Mount flov c) Metal flow	n for v Instrument · Index	b) d)	Money fix Installment Melt flow Index		
2	 The core of G a) bentonite c) clay 	CL is made of clay		cement timber		
3	 Which of the feature a) Crushing s c) Impact test 	ollowing tests measu strength test st	res the b) d)	toughness of road aggregates Abrasion test Shape test	\$?	
4) The sum of fla a) 15 c) 30	kiness index and elo	ngatior b) d)	n index should not exceed 20 40	_ .	
5	i) The width of g a) 25 mm c) 15 mm	rips for performing th	e grab b) d)	tensile strength is, 10 mm 35 mm		
6	i) To protect geo a) Plastic c) Benzene	synthetic from UV ex	(posure b) d)	e is added to it. Carbon Black Cement		
7	 The shape of a a) Square c) Triangular 	apertures in geonets	is b) d)	 Circular Diamond		
8	 A planar, polying network of interview the junctions, a) Geotextile 	meric product consist rsecting tensile-resis s called	ing of tant el b)	a mesh or net-like regular oper ements, integrally connected a Geogrid	า เt	
~	c) Geonet		d)	Geocell		
g	synthetic polyr a) Rubber c) Crude pet	used in the manufact ners generally derive roleum oils	d from b) d)	Fiberglass		
1	0) Indian standar	d for sampling of geo	synthe	etic specimens is		

a) IS 800 c) IS 456 IS 14706 IS 2700 b) d)

SLR-FM-58

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-58

Max. Marks: 40

Set Q

Seat No.						Set	R
		T.E. (Part – II) (Old) (CGPA)	Exami	nation Nov/Dec-2019		
		GEOSYNTHE	Civil Eng	ineeri DRCEI	ng D SOIL STRUCTURES		
Day &	Date	: Thursday, 28-1	1-2019		Max.	. Marks	s: 50
Time: 1	10:00	AM To 12:00 P	М				
Instruc	ction	s: 1) Q. No.1 is answer boo	compulsory and it s	should	be solved in first 20 minutes	s in	
		2) Figures to	right indicate full m	arks.	nd atata it alaarlu		
		3) Assume a	antional data, if red	quirea a Evne (nd state it clearly.		
Duratio	on: 20) Minutes		i ype d		Marks	s: 10
Q.1 (Choo	se the correct	alternatives from	the opt	ions and rewrite the		10
s 1	sente)	ence. The sum of flak	iness index and eld	ongatior	n index should not exceed _		
	,	a) 15		b)	20		
2	2)	C) 30 The width of ari	ns for performing th	a) De arab	40 tensile strength is		
2	-)	a) 25 mm		b)	10 mm	_ .	
		c) 15 mm		d)	35 mm		
3	3)	a) Plastic	synthetic from UV e	xposure b)	e is added to it. Carbon Black		
		c) Benzene		d)	Cement		
4	1)	The shape of ap	pertures in geonets	is h)	 circular		
		c) Triangular		d)	diamond		
5	5)	A planar, polym	eric product consis	ting of a	a mesh or net-like regular o ements_integrally_connecte	pen ed at	
		the junctions, is	called		- · · ·		
		a) Geotextile c) Geonet		b) d)	Geogrid Geocell		
6	5)	The materials u	sed in the manufac	turing c	of geosynthetics are primari	ly	
		synthetic polym	ers generally derive	ed from	 Fiberalass		
		c) Crude petro	oleum oils	d)	Jute		
7	7)	Indian standard	for sampling of geo	osynthe	etic specimens is		
		a) IS 800 c) IS 456		b) d)	IS 14706 IS 2700		
8	3)	MFI is acronym	for	,			
		a) Mount flowc) Metal flow I	Instrument ndex	b) d)	Money fix Installment Melt flow Index		
ç	9)	The core of GC	L is made of	~, 			
		a) bentonite o	lay	b)	cement timbor		
1	10)	Which of the fol	lowing tests measu	u) Ires tha	toughness of road aggrega	ates?	
I		a) Crushing st	rength test	b)	Abrasion test		

a) Crushing strength testb) Abrasion tec) Impact testd) Shape test

SLR-FM-58

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-58

0

Max. Marks: 40

40

Set F

Set

Max. Marks: 50

Marks: 10

S

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No.1 is compulsory and it should be solved in first 20 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Assume additional data, if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1	Choo sente	ose the correct alternatives from th ence.	e opt	ions and rewrite the	10
	1)	A planar, polymeric product consistine network of intersecting tensile-resist the junctions, is called	ng of ant el	a mesh or net-like regular open ements, integrally connected at	
		a) Geotextile	b)	Geogrid	
	2)	c) Geonet	a) Tringa		
	2)	synthetic polymers generally derived	from		
		a) Rubber	b)	Fiberglass	
		c) Crude petroleum oils	d)	Jute	
	3)	Indian standard for sampling of geos	synthe	etic specimens is	
		a) IS 800	b)	IS 14706	
		c) IS 456	d)	IS 2700	
	4)	MFI is acronym for			
		a) Mount flow Instrument	b)	Money fix Installment	
		c) Metal flow Index	d)	Melt flow Index	
	5)	The core of GCL is made of	<u> </u>		
		a) bentonite clay	b)	cement	
	\mathbf{O}		a)		
	6)	Which of the following tests measure	es the	toughness of road aggregates?	
		a) Crushing strength test	d)	Shape test	
	7)	The sum of flokinger index and alon	u) action	Shape lest	
	7)	a) 15	galior b)		
		c) 30	d)	40	
	8)	The width of grips for performing the	arab	tensile strength is	
	0)	a) 25 mm	b)	10 mm	
		c) 15 mm	d)	35 mm	
	9)	To protect geosynthetic from UV exp	osur	e is added to it.	
	,	a) Plastic	b)	Carbon Black	
		c) Benzene	d)	Cement	
	10)	The shape of apertures in geonets is	S		
		a) Square	b)	circular	
		c) Triangular	d)	diamond	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

GEOSYNTHETICS & REINFORCED SOIL STRUCTURES

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Figures to right indicate full marks.

2) Assume additional data, if required and state it clearly.

Q.2 Attempt any eight questions

- a) List the various functions performed by geosynthetics. Explain any one in detail.
- **b)** Explain Geosynthtics application in pavement for separation and reinforcement.
- c) Explain the process of construction of landfill using geosynthetics.
- d) Explain with the help of sketch geosynthetic clay liner (GCL) as a barrier.
- e) List the various processes by which,
 - i) non-woven geosynthetics
 - ii) geogrids are manufactured
- f) What are the mechanical properties of geosynthetics?
- g) How are impact and abrasion tests conducted?
- **h)** List the assumptions made by Binquet and Lee in their analysis of reinforced earth beds.
- i) With a neat sketch explain the procedure for
 - i) In plane permeability of geosynthetics.
 - ii) Grab tensile strength of geosynthetics.
- **j)** What are the different construction factors that affect the performance of reinforced soil?

SLR-FM-58

Max. Marks: 40

Set S

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering PLANNING FOR SUSTAINABLE DEVELOPMENT

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Figures to right indicate full marks.

2) Assume any suitable data if needed.

Attempt any five of the following question. (10 marks each)

- **Q.1** Explain main principles of sustainable development.
- **Q.2** Write a short note on Innovation strategies & Environmental Management.
- Q.3 What is institutional theory in sustainable development?
- **Q.4** Write a note on policy responses to environmental degradation.
- **Q.5** As a Civil Engineer discuss measures to be taken for sustainable development in civil engineering projects.
- **Q.6** Explain 'Squaring the circle' concept in sustainable management.
- **Q.7** How innovation contributes in sustainable development? Explain.



Max. Marks: 50

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10
 - 1) KAIZEN Means
 - a) Quality improvement Technique
 - b) Change to become good
 - c) Achieving Quality
 - d) None
 - The underlying cause(s) of TQM deficiencies is (are): 2)
 - The failure of managers to understand the concept of quality a)
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option
 - Total quality costs include: 3)
 - a) Prevention costs b) Appraisal costs
 - c) Failure costs d) All of the given options
 - 4) MIS structure is based on ____
 - Management Activity Population b) a)
 - c) Both a) and b) None d)

ISO 9000 seek's standardization in terms of 5)

- a) Products production procedures b)
- c) suppliers specifications d) procedures to manage quality
- 6) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information system Knowledge system b)
 - c) Database system d) Computer system
- The objective of ISO-9000 family of Quality management is _____ 7)
 - a) Customer satisfaction Employee satisfaction b) Environmental issues
 - c) Skill enhancement d)
- TQM & ISO both focuses on 8)
 - a) Customer b) Employee
 - All of the above c) Supplier d)

Set

Max. Marks: 50

Marks: 10



- a) systems designer
- b) project manager
- c) systems owner
- d) systems builder
- 10) Internal information for MIS may come from any one of the following department _____.
 - a) Customers care department
 - c) Marketing department
- b) HR department
- d) Production department

Set P

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2.

2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- **d)** Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40

40

Set P

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- An _____ is a set of processes and procedures that transform data into 1) information and knowledge.
 - a) information system
 - b) Knowledge system c) Database system Computer system d)
- 2) The objective of ISO-9000 family of Quality management is
 - a) Customer satisfaction c) Skill enhancement
- Employee satisfaction b) d) Environmental issues
- TQM & ISO both focuses on 3)
 - a) Customer b) Employee
 - All of the above c) Supplier d)
- 4) The person who ensures that systems are developed on time, within budget, and with acceptable guality is a
 - a) systems designer c) systems owner
- project manager b) d) systems builder
- 5) Internal information for MIS may come from any one of the following
 - department _____. a) Customers care department
 - c) Marketing department
- 6) KAIZEN Means
 - a) Quality improvement Technique
 - b) Change to become good
 - c) Achieving Quality
 - d) None
- 7) The underlying cause(s) of TQM deficiencies is (are): _____
 - a) The failure of managers to understand the concept of quality
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option
- 8) Total quality costs include: _____
 - a) Prevention costs b) c) Failure costs
- Appraisal costs All of the given options d)

- HR department b)
 - d) Production department

Marks: 10

10



Max. Marks: 50

SLR-FM-60 Set Q

9) MIS structure is based on _____.

- a) Management Activity _____ b)
- c) Both a) and b)
- b) Populationd) None
- 10) ISO 9000 seek's standardization in terms of _
 - a) products
 - c) suppliers specifications
- erms of _____. b) production procedures
- d) procedures to manage quality

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2.

2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- **d)** Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40

40

Set Q

Set

Seat No.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- The person who ensures that systems are developed on time, within 1) budget, and with acceptable guality is a .
 - a) systems designer
 - b) c) systems owner d)
- 2) Internal information for MIS may come from any one of the following department .
 - a) Customers care department
- b) HR department d) Production department

project manager

systems builder

- 3) KAIZEN Means
 - a) Quality improvement Technique
 - b) Change to become good

c) Marketing department

- c) Achieving Quality
- d) None
- 4) The underlying cause(s) of TQM deficiencies is (are): ____
 - The failure of managers to understand the concept of quality a)
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option

c) Failure costs

5) Total quality costs include: a) Prevention costs

b) Appraisal costs

d) All of the given options

- 6) MIS structure is based on ____
 - Population a) Management Activity b) c) Both a) and b) d) None
- ISO 9000 seek's standardization in terms of 7)
 - a) products production procedures b)
 - c) suppliers specifications procedures to manage quality d)
- 8) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information system c) Database system
- Knowledge system b)
- Computer system d)

Max. Marks: 50

Marks: 10

R



- 9) The objective of ISO-9000 family of Quality management is _____.
 - a) Customer satisfaction
- Employee satisfaction b)
- c) Skill enhancement
- Environmental issues d)
- TQM & ISO both focuses on ______ b) 10)

 - c) Supplier
- Employee
- All of the above d)

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2.

2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- **d)** Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40

40

Set R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** TQM AND MIS IN CIVIL ENGINEERING Day & Date: Thursday, 28-11-2019 Max. Marks: 50 Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

2)

6)

9)

b)

d) None

Time: 10:00 AM To 12:00 PM

book.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- Total quality costs include: 1)
 - a) Prevention costs b) c) Failure costs d)
 - All of the given options MIS structure is based on ____
 - Population a) Management Activity b)
 - c) Both a) and b) None d)

ISO 9000 seek's standardization in terms of 3)

- production procedures a) products b) c) suppliers specifications d) procedures to manage quality
- 4) An _____ is a set of processes and procedures that transform data into information and knowledge.
 - a) information system c) Database system
- Knowledge system b) d) Computer system

Appraisal costs

- 5) The objective of ISO-9000 family of Quality management is _
 - a) Customer satisfaction b) Employee satisfaction Environmental issues d)
 - c) Skill enhancement
 - TQM & ISO both focuses on ____
 - b) a) Customer Employee
 - All of the above c) Supplier d)
- 7) The person who ensures that systems are developed on time, within budget, and with acceptable quality is a
 - a) systems designer project manager b)
 - c) systems owner systems builder d)
- 8) Internal information for MIS may come from any one of the following department
 - a) Customers care department b) HR department
 - c) Marketing department

a) Quality improvement Technique Change to become good

KAIZEN Means

c) Achieving Quality

Production department d)

SLR-FM-60



Marks: 10

SLR-FM-60 Set S

- 10) The underlying cause(s) of TQM deficiencies is (are): _____.
 - a) The failure of managers to understand the concept of quality
 - b) Costly implementation of quality management system
 - c) Lack of employee involvement
 - d) All of the given option

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TQM AND MIS IN CIVIL ENGINEERING

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt any four questions from Q. No.2.

2) Figures to right indicate full marks.

Q.2 Attempt any Four.

- a) What are the factors affecting the poor quality and Construction?
- **b)** Differentiate between Quality Control and Quality Assurance.
- c) Give Measures to overcome the causes responsible for poor quality of construction.
- **d)** Discuss the advantages of implementing TQM in the Indian construction sector.
- e) Define data and information. What are the major differences between them? Explain with the help of suitable Example.
- f) What data information is required for planning of new road corridor between two megacities?
- **g)** Write a detailed note on application of mobile technology in construction Industry.

Max. Marks: 40

40

Set S

Set

Ρ

Seat	
No.	

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE RESISTANT NON ENGINEERED

Day & Date: Thursday, 28-11-2019 Time: 10:00 AM To 12:00 PM

Max. Marks: 50

Instructions: 1) Figures to right indicate full marks.

2) Assume suitable data if necessary and mention it clearly.3) Solve any five questions.

Q.1	Explain the effects of an Earthquake.	10
Q.2	What are the causes of an Earthquake?	10
Q.3	Explain the different magnitude scales to measure an earthquake.	10
Q.4	What are causes of damages due to earthquake in the stone masonry construction?	10
Q.5	What is meant by Restoration of strength? What are techniques for restoration?	10
Q.6	Explain the soil liquefaction as an effect of earthquake.	10

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Answer MCQ/objectives type question on answer sheet.
- 3) Figure to the right indicate full marks.
- 4) Assume suitable data if required and mentioned clearly.
- 5) use of non-programmable calculator allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Consider the following statements regarding the Hydration of cement 1)
 - i) It is a instantaneous one
 - ii) Hydration is mainly contributed from the hydration of C₃S
 - Hydration process is slower in the early period and continues iii) indefinitely at a increasing rate
 - iv) Product of hydration is referred as C-S-H gel of these
 - i, ii, iii are correct a)
- b) i, iii, iv are correct
- ii, iv alone is correct d) ii, iii alone is correct C)
- 2) The quantity of Gypsum added in cement varies from 2 to 3% will depend upon the quantity of _____.
 - a) C₃A in cement
 - C₃S in cement C)
- b) C4AF in cement
- d) C₃S & C₂S in cement
- 3) Gypsum consists of _____.

a)

c)

- H₂S and CO₂
- b) CaSO₄ Lime and H₂O d) CO₂ and calcium
- If 'P' is the standard consistency of cement, the amount of water used in 4) conduction the initial setting time test on cement is _____.
 - 0.65 P a) b) 0.85 P
 - 0.6 P d) 0.8 P c)
- The compressive strength of a standard 1:3 port land cement sand mortar 5) after 28 days of curing should not be less than
 - 115 kg/cm² 330 kg/cm² a) b)
 - 175 kg/cm² d) 210 kg/cm^2 c)
- 6) The maximum percentage of deleterious material permitted in aggregate is about _____.
 - 7 a) 10 b) C) 3 d) 1

Max. Marks: 70

Set

Marks: 14



- concrete
 - $15 \times 15 \times 50$ cm a)
- b) $15 \times 15 \times 60$ cm
- c) $15 \times 15 \times 70$ cm d) $15 \times 15 \times 75$ cm
- 11) The concrete mix of good workability should have a minimum water cement ratio of _____.
 - 0.4 a) 0.2 b) 0.8
 - c) 0.6 d)
- The factor which affects the design of concrete mix is _____. 12)
 - a) Fineness modulus b) Water-cement ratio c) Slump
 - d) All the above
- 13) High degree of workability is required for
 - a) Heavily reinforced sections
 - c) Hand placed pavements
- Mass concrete b) Tremie concrete
- d)
- 14) Calcium lignosulphate is an example of
 - a) Retarder Accelerator b)
 - c) Dispersal agent d) Hardness agent

1.0%

		S.E. (Part – I) (Old) (CGPA) Examinatio Civil Engineering	n Nov/Dec-2019			
CONCRETE TECHNOLOGY						
Day & Time	& Dat : 10:0	e: Saturday, 07-12-2019 00 AM To 01:00 PM	Max. Marks: 56			
Instr	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Use of non-programmable calculator allowed 4) Assume suitable data if required and mentional 	ed. oned clearly.			
		Section – I				
Q.2	Writ a) b) c) d)	e notes and draw sketches in support of your a Compounds of cement Bulkage of fine aggregates Initial setting time and final setting time of cemen Methods of curing	answer. (any three) 12			
Q.3	Solv a) b) c) d)	ve any three. Explain effect of temperature on strength of conc Enlist methods of curing concrete. Write a note on workability and its measure. Write note on super plasticizers.	rete.			
Q.4	Writ	e about effect of shape of aggregate on performar	ce of concrete. 04			
	OR Write on Blasticizoro					
	vviit	e on Flashcizers.				
0.5	Salı		10			
Q.3	a) b) c)	Define Durability and what are the factors affectin Write a note on ready mix concrete. Explain durability of concrete.	ng durability of concrete.			
Q.6	Des	ign concrete mix of grade M20 by IS method by	y using following data. 10			
	a)	 Design stipulations Character compressive strength required in t field at 28 days Maximum size of aggregate Degree of workability Degree of quality control 	the 20 MPa 20 mm (angular) 0.90 compacting factor Good			
	b)	 5) Type of Exposure Test data for Materials 1) Specific gravity of cement 2) Compressive strength of cement at 7 days 3) i) Specific gravity of coarse aggregates ii) Specific gravity of fine aggregates 4) Water absorption i) Coarse aggregate 	3.15 Satisfies the requirement 2.60 2.60 0.50%			

ii) Fine aggregate

Set P

- Seat No.

5) Free (surface) moisture

i) Coarse aggregate

ii) Fine aggregate

Q.7 Write in details on high performance concrete.

OR

Nil

2.0%

Differentiate between design mix and nominal mix concrete along with the factors governing mix design.





Fig.1 Relationship between Free Water-Cement Ratio and Concrete Strength for Different Cement Strengths (Ref : IS 10262-1982)

06



SLR-FM-620 Set P

Table ⁻	Assumed Star (Ref : IS 456-	ndard Deviation -2002)
SI. No. Grade of Concrete		Assumed Standard Deviation (N/mm ²)
1	M 10	0.50
2	M 15	3.50
3	M 20	40
4	M 25	4.0
5	M 30	
6	M 35	
7	M 40	E OO
8	M 45	
9	M 50	
10	M 55	

x.

	Maximum Size of (Clauses 4.2, A-5	Aggregate and B-5)
SI No.	Nominal Maximum Size of Aggregate	Maximum Water Content ¹⁹
	лт	ke
(1)	(2)	(3)
i)	10	208
in	20	186
iii)	40	165
NOTE	I — These quantities of mi king committious material e	ixing water are for use i contents for trial batches.

Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate (Clauses 4.4, A-7 and B-7)

Volume of Coarse Aggregate" per Unit SL Nominal Volume of Total Aggregate for No. Maximum Size of Different Zones of Fine Aggregate Aggregate Zone IV בתותו Zone III Zone II Zoncl (1) (2) (3) (4) (5) (6) i) 10 0.50 0.48 0.46 0.44 20 0.66 0.64 11) 0.62 0.60 40 iii) 0.75 0.73 0.71 0.69 ¹⁵ Volumes are based on aggregates in saturated surface dry condition.

Table & Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size

sı Na	Reposure	Papacura Plain Concrete			Reinforced Concrete		
		Minimum Cerrent Content kg/m ³	Maximum Free Water- Cement Ratio	Minianasa Grado of Councié	Minimum Coment Content kg/m ³	Maximum Free Water- Coment Ratio	Minimum Grade of Concrete
1)	(2)	(3)	(4)	(5)	(6)	(T)	(8)
1)	Mild	220	0.60	-	300	0.55	M 20 *
Lilj	Modecate	240	0.60	M 15	300	0.50	M 25
ill)	Severe	250	0.50	M 20	320	0.45	M 30
ir)	Very severe	260	0.45	M 20	340	0.45	M 35
*1	Extreme	280	0.40	M 25	360	0.40	M 40

NOTES 1. Cement content prescribed in this table is irrespective of the grades of cement and it is inclusive of additions mentioned in 5.2. The additions such as fly axh or ground granulated blast furnees sing may be taken into account in the concrete composition with respect to the coment content and water-cement ratio if the suitability is established and as long as the maximum amounts taken into account do not exceed the limits of pozzolona and sing specified in 15 1489 (Part I) and IS 455 respectively.

I Minimum grade for plain concrete under mild exposure condition is not specified.

	Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
10 mm	100	100	100	100
4·75 mm	90-100	90-100	90-100	95-100
2·36 mm	60-95	75-100	85-100	95-100
1·18 mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15

SLR-FM-620

Set P

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Answer MCQ/objectives type question on answer sheet.
- 3) Figure to the right indicate full marks.
- 4) Assume suitable data if required and mentioned clearly.
- 5) use of non-programmable calculator allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - Consider the following statements: _ 1)
 - Sea water accelerates the setting time of cement i)
 - Sea water accelerates the early strength of cement ii)
 - iii) Factor for corrosion is the use of sea water of these
 - a) i, ii are wrong

ii alone wrong

- i alone wrong b) d) All are correct
- 2) Which of the following fig. represents that the concrete is non-cohesive and shows the characteristic of segregation?

b)

d)

d)

a)

c)

c)









- 3) The standard size of specimen for conducting the modulus of rupture of concrete . b)
 - $15 \times 15 \times 50$ cm a)
 - $15 \times 15 \times 70$ cm c)

 $15 \times 15 \times 60$ cm $15 \times 15 \times 75$ cm

4) The concrete mix of good workability should have a minimum water cement ratio of

a)	0.2	b)	0.4
C)	0.6	d)	0.8



Max. Marks: 70

			SLR-FM-620
			Set Q
5)	The factor which affects the design a) Fineness modulus c) Slump	of cor b) d)	ncrete mix is Water-cement ratio All the above
6)	High degree of workability is require a) Heavily reinforced sections c) Hand placed pavements	ed for b) d)	Mass concrete Tremie concrete
7)	Calcium lignosulphate is an examp a) Retarder c) Dispersal agent	le of _ b) d)	 Accelerator Hardness agent
8)	Consider the following statements i	egard	ing the Hydration of cement
	 i) It is a instantaneous one ii) Hydration is mainly contribute iii) Hydration process is slower in indefinitely at a increasing rate iv) Product of hydration is referre a) i, ii, iii are correct c) ii, iv alone is correct 	d from the e d as C b) d)	the hydration of C ₃ S arly period and continues C-S-H gel of these i, iii, iv are correct ii, iii alone is correct
9)	The quantity of Gypsum added in c upon the quantity of a) C_3A in cement c) C_3S in cement	emen b) d)	t varies from 2 to 3% will depend C4AF in cement C ₃ S & C ₂ S in cement
10)	Gypsum consists of a) H_2S and CO_2 c) Lime and H_2O	b) d)	$CaSO_4$ CO_2 and calcium
11)	If 'P' is the standard consistency of conduction the initial setting time te a) 0.65 P c) 0.6 P	ceme st on b) d)	nt, the amount of water used in cement is 0.85 P 0.8 P
12)	The compressive strength of a stan after 28 days of curing should not b a) 330 kg/cm ² c) 175 kg/cm ²	idard [/] e less b) d)	1:3 port land cement sand mortar than 115 kg/cm ² 210 kg/cm ²
13)	The maximum percentage of delete is about a) 10 c) 3	erious b) d)	material permitted in aggregate 7 1
14)	For concrete mix pH value of water a) 7 c) 8	shall b) d)	not be less than 6 9

		S.E. (Part – I) (Old) (CGPA) Examinatio	n Nov/Dec-2019	
Day o Time	& Dat	te: Saturday, 07-12-2019	Max. Marks:	56
Instr		ns: 1) All questions are compulsory		
mou		 2) Figures to the right indicate full marks. 3) Use of non-programmable calculator allowed 4) Assume suitable data if required and mention 	ed. oned clearly.	
		Section – I		
Q.2	Wrii a) b) c) d)	te notes and draw sketches in support of your Compounds of cement Bulkage of fine aggregates Initial setting time and final setting time of cemen Methods of curing	answer. (any three) t	12
Q.3	Solv a) b) c) d)	ve any three. Explain effect of temperature on strength of conc Enlist methods of curing concrete. Write a note on workability and its measure. Write note on super plasticizers.	rete.	12
Q.4	Writ	e about effect of shape of aggregate on performar	nce of concrete.	04
	Writ	e on Plasticizers.		
		Section – II		
Q.5	Sol ^y a) b) c)	ve any two. Define Durability and what are the factors affectir Write a note on ready mix concrete. Explain durability of concrete.	ng durability of concrete.	12
Q.6	Des	ign concrete mix of grade M20 by IS method by	y using following data.	10
	a)	 Character compressive strength required in t field at 28 days 	the 20 MPa	
	b)	 Maximum size of aggregate Degree of workability Degree of quality control Type of Exposure 	20 mm (angular) 0.90 compacting factor Good Mild	
	U)	 Specific gravity of cement Compressive strength of cement at 7 days i) Specific gravity of coarse aggregates Specific gravity of fine aggregates Water absorption Coarse aggregate 	3.15Satisfies the requirement2.602.600.50%	

Coarse aggregate ii) Coarse aggregateiii) Fine aggregate 1.0%

No.

Seat

• ` . Set Q

5) Free (surface) moisture

i) Coarse aggregate

ii) Fine aggregate

Q.7 Write in details on high performance concrete.

OR

Nil

2.0%

Differentiate between design mix and nominal mix concrete along with the factors governing mix design.





Fig.1 Relationship between Free Water-Cement Ratio and Concrete Strength for Different Cement Strengths (Ref : IS 10262-1982)

06



SLR-FM-620 Set Q

Table 1 Assumed Standard Deviation (Ref : IS 456-2002)				
SI. No.	Grade of Concrete	Assumed Standard Deviation (N/mm ²)		
1	M 10	9 50		
2	M 15	3.30		
. 3	M 20	10		
4	M 25	4.0		
5	M 30			
6	M 35	•		
7	M 40	5.00		
8	M 45			
9	M 50			
10	M 55			

(Clauses 4.2, A-5 and B-5)						
SI No.	Nominal Maximum Size of Aggregate	Maximum Water Content ¹⁰				
	лm	kg				
(1)	(2)	(3)				
i)	10	208				
iń	20	186				
iii)	40	165				
LEVET	. These accontition of mi	When matter are for new i				

SLR-FM-620 Set Q

Table 3 Volume of Coarse Aggregate per Unit **Volume of Total Aggregate for Different** Zones of Fine Aggregate (Clauses 4.4, A-7 and B-7)

SI No.	Nominal Maximum Size of Aggregate	Volume (Volu Differ	Volume of Coarse Aggregate" per Us Volume of Total Aggregate for Different Zones of Fine Aggregate				
(1)	mm (2)	Zone [V (3)	Zone [1] (4)	Zone (1 (5)	Zonc I (5)		
i)	10	0.50	0,48	0.46	0.44		
ii)	20	0.66	0.64	0.62	0.60		
iii)	40	0.75	0.73	0.71	6.69		

Table & Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size

SI No.	Represent	Experience Plain Concrete			Relatered Concrete		
		Minimum Cerrent Content kg/m ³	Maximum Proc Water- Cement Ratio	Mintanana Grade of Councié	Minimum Coment Content kg/m ³	Maximum Proc Water- Cement Ratio	Minimum Grade of Concrete
1)	(2)	(3)	(4)	(5)	(6)	(T)	(8)
1)	Mild	220	0.60	-	300	0.55	M 20 *
111)	Modecate	240	0.60	M 15	300	0.50	M 25
ill)	Severe	250	0.50	M 20	320	0.45	M 30
i*)	Very severe	260	0.45	M 20	340	0.45	M 35
*)	Extreme	280	0.40	M 25	360	0.40	M 40

NOTES 1 Cement content prescribed in this table is irrespective of the grades of cement and it is inclusive of additions mentioned in 5.2. The additions such as fly ash or ground granulated blast furnees slag may be taken into account in the concrete composition with respect to the concent content and water-comment ratio if the suitability is established and as long as the maximum amounts taken into account do not exceed the limit of potential ratio if the councerty is established and as long as the maxi-not exceed the limit of potential and specified in 15 1489 (Part I) and IS A55 respectively. I Minimum grade for plain concrete under mild expenses concludes is not encoded.

	Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
10 mm	100	100	100	100
4·75 mm	90-100	90-100	90-100	95-100
2·36 mm	60-95	75-100	85-100	95-100
1·18 mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15
Set

Max. Marks: 70

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering CONCRETE TECHNOLOGY

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Answer MCQ/objectives type question on answer sheet.
- 3) Figure to the right indicate full marks.
- 4) Assume suitable data if required and mentioned clearly.
- 5) use of non-programmable calculator allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

3)

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The compressive strength of a standard 1:3 port land cement sand mortar after 28 days of curing should not be less than _____.
 - a) 330 kg/cm^2 b) $115 \overline{\text{kg/cm}^2}$
 - c) 175 kg/cm^2 d) 210 kg/cm^2
- 2) The maximum percentage of deleterious material permitted in aggregate is about _____.
 - a) 10 b) 7 c) 3 d) 1
 - c) 3 d) 1
 - For concrete mix pH value of water shall not be less than _____. a) 7 b) 6
 - c) 8 d) 9
- 4) Consider the following statements: ____
 - i) Sea water accelerates the setting time of cement
 - ii) Sea water accelerates the early strength of cement
 - iii) Factor for corrosion is the use of sea water of these
 - a) i, ii are wrong b) i alone wrong
 - c) ii alone wrong d) All are correct
- 5) Which of the following fig. represents that the concrete is non-cohesive and shows the characteristic of segregation?
 - ST.

d)

b)



a)

Set 6) The standard size of specimen for conducting the modulus of rupture of concrete . a) $15 \times 15 \times 50$ cm b) $15 \times 15 \times 60$ cm c) $15 \times 15 \times 70$ cm d) $15 \times 15 \times 75$ cm 7) The concrete mix of good workability should have a minimum water cement ratio of _____. a) 0.2 b) 0.4 c) 0.6 d) 0.8 8) The factor which affects the design of concrete mix is _____ a) Fineness modulus Water-cement ratio b) d) c) Slump All the above High degree of workability is required for _ 9) a) Heavily reinforced sections b) Mass concrete c) Hand placed pavements d) Tremie concrete Calcium lignosulphate is an example of 10) a) Retarder b) Accelerator c) Dispersal agent d) Hardness agent Consider the following statements regarding the Hydration of cement 11) i) It is a instantaneous one Hydration is mainly contributed from the hydration of C₃S ii) iii) Hydration process is slower in the early period and continues indefinitely at a increasing rate Product of hydration is referred as C-S-H gel of these iv) i, ii, iii are correct b) i, iii, iv are correct a) ii, iv alone is correct d) ii, iii alone is correct C) The quantity of Gypsum added in cement varies from 2 to 3% will depend 12) upon the quantity of ____ __. a) C₃A in cement b) C4AF in cement C₃S in cement d) $C_3S \& C_2S$ in cement C) Gypsum consists of 13) H₂S and CO₂ b) CaSO₄ a) Lime and H₂O d) CO₂ and calcium C) If 'P' is the standard consistency of cement, the amount of water used in 14)

- conduction the initial setting time test on cement is _____. a) 0.65 P b) 0.85 P
 - a) 0.65 P c) 0.6 P
- b) 0.85 P d) 0.8 P

SLR-FM-620

Seat No.	t]				
		S.E. (Part – I	Old) (C) (C) Civ CONCR	GPA) E ril Engi ETE TE	xaminat neering CHNOL	tion Nov/ OGY	Dec-2019
Day & Time	& Dat : 10:0	te: Saturday, 07-1 00 AM To 01:00 F	12-2019 M				Max
Instr	uctio	ons: 1) All questio 2) Figures to 3) Use of nor 4) Assume s	ns are com the right ind programm uitable data	pulsory. dicate ful nable calo if require	ll marks. culator allo ed and me	owed. entioned cle	early.
				Section	n – I		
Q.2	Writ a) b) c) d)	te notes and dra Compounds of o Bulkage of fine a Initial setting tim Methods of curir	w sketches cement aggregates le and final s ng	s in supp setting tir	port of yo me of cem	ur answer. nent	(any three
~ ~	<u> </u>						

Q.3 Solve any three.

- Explain effect of temperature on strength of concrete. a)
- Enlist methods of curing concrete. b)
- Write a note on workability and its measure. C)
- Write note on super plasticizers. d)
- Write about effect of shape of aggregate on performance of concrete. 04 Q.4 OR

Write on Plasticizers.

Section – II

Q.5 Solve any two.

- Define Durability and what are the factors affecting durability of concrete. a)
- Write a note on ready mix concrete. b)
- Explain durability of concrete. c)

Design concrete mix of grade M20 by IS method by using following data. Q.6 10

- **Design stipulations** a)
 - Character compressive strength required in the 20 MPa 1) field at 28 days

2)	Maximum size of aggregate	20 mm (angular)
3)	Degree of workability	0.90 compacting factor
4)	Degree of quality control	Good
5)	Type of Exposure	Mild
Tes	at data for Materials	
1)	Specific gravity of cement	3.15
2)	Compressive strength of cement at 7 days	Satisfies the requirement
3)	i) Specific gravity of coarse aggregates	2.60
	ii) Specific gravity of fine aggregates	2.60
4)	Water absorption	
	i) Coarse aggregate	0.50%
	ii) Fine aggregate	1.0%
	2) 3) 4) 5) Tes 1) 2) 3) 4)	 Maximum size of aggregate Degree of workability Degree of quality control Type of Exposure Test data for Materials Specific gravity of cement Compressive strength of cement at 7 days i) Specific gravity of coarse aggregates ii) Specific gravity of fine aggregates Water absorption Coarse aggregate Fine aggregate



Max. Marks: 56

12

12

5) Free (surface) moisture

i) Coarse aggregate

ii) Fine aggregate

Q.7 Write in details on high performance concrete.

OR

Nil

2.0%

Differentiate between design mix and nominal mix concrete along with the factors governing mix design.





Fig.1 Relationship between Free Water-Cement Ratio and Concrete Strength for Different Cement Strengths (Ref : IS 10262-1982)

06



SLR-FM-620 Set R

Table ⁻	Assumed Star (Ref : IS 456-	ndard Deviation -2002)
SI. No.	Grade of Concrete	Assumed Standard Deviation (N/mm ²)
1	M 10	9 50
2	M 15	- 3.30
3	M 20	40
4	M 25	4.0
5	M 30	
6	M 35	•
7	M 40	E OO
8	M 45	
9	M 50	
10	M 55	

Maximum Size of Aggregate (Clauses 4.2, A-5 and B-5)					
SI No.	Nominal Maximum Size of Aggregate	Maximum Water Content ¹⁹			
	лт	kg			
(1)	(2)	(3)			
i)	10	208			
in	20	186			
iii)	40	165			
NOTE	I — These quantities of mi	ixing water are for use i contents for trial batches.			

SLR-FM-620 Set R

Table 3 Volume of Coarse Aggregate per Unit **Volume of Total Aggregate for Different** Zones of Fine Aggregate (Clauses 4.4, A-7 and B-7)

No.	Maximum Vo Size of Diff Aggregate		Volume of Coarse Aggregate per Volume of Total Aggregate for Different Zones of Fine Aggrega					
(1)	mm (2)	Zone [V (3)	Zone [1] (4)	Zone (1 (5)	Zone I (5)			
i)	10	0.50	0,48	0.46	0.44			
ii)	20	0.66	0.64	0.62	0.60			
iii)	40	0.75	0.73	0.71	0.69			

Table & Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size

și Na	Represente Plain Concrete				Reinforced Concrete		
		Minimum Cernent Content kg/m ³	Maximum Free Water- Cement Ratio	Minimasa Grade of Councie	Minimum Coment Coatent kg/m ³	Maximum Free Water- Cement Ratio	Minimum Grade of Concrete
1)	(2)	(3)	(4)	(5)	(6)	(T)	(8)
D	Mild	220	0.60	-	300	0.55	M 20 *
Lill	Modecate	240	0.60	M 15	300	0.50	M 25
ill)	Severe	250	0.50	M 20	320	0.45	M 30
ir)	Very severe	260	0.45	M 20	340	0.45	M 35
*)	Extreme	280	0.40	M 25	360	0.40	M 40

NOTES 1 Cement content prescribed in this table is irrespective of the grades of cement and it is inclusive of additions mentioned in 5.2. The additions such as fly ash or ground granulated blast furnees slag may be taken into account in the concrete composition with respect to the concent content and water-comment ratio if the suitability is established and as long as the maximum amounts taken into account do not exceed the limit of pozzolona and sing specified in 35 1489 (Part I) and IS ASS raspectively. I Minimum grade for pluin concrete under mild exposure conducton is not reacting.

	Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
10 mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	95-100
2·36 mm	60-95	75-100	85-100	95-100
1·18 mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

Civil Engineering CONCRETE TECHNOLOGY

- Answer MCQ/objectives type question on answer sheet.
- 3) Figure to the right indicate full marks.
- 4) Assume suitable data if required and mentioned clearly.
- 5) use of non-programmable calculator allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The standard size of specimen for conducting the modulus of rupture of concrete . $15 \times 15 \times 60$ cm
 - $15 \times 15 \times 50$ cm b) a)
 - $15 \times 15 \times 70$ cm d) $15 \times 15 \times 75$ cm c)
- 2) The concrete mix of good workability should have a minimum water cement ratio of
 - a) 0.2 b) 0.4 d) 0.8 c) 0.6
- 3) The factor which affects the design of concrete mix is _____
 - a) Fineness modulus Water-cement ratio b)
 - c) Slump d) All the above
- 4) High degree of workability is required for _
 - a) Heavily reinforced sections b) Mass concrete
 - c) Hand placed pavements d) Tremie concrete
- Calcium lignosulphate is an example of 5)
 - a) Retarder Accelerator b)
 - c) Dispersal agent d) Hardness agent
- Consider the following statements regarding the Hydration of cement 6)
 - i) It is a instantaneous one
 - Hydration is mainly contributed from the hydration of C₃S ii)
 - Hydration process is slower in the early period and continues iii) indefinitely at a increasing rate
 - Product of hydration is referred as C-S-H gel of these iv)
 - i, ii, iii are correct i, iii, iv are correct a) b) c)
 - ii, iv alone is correct d) ii, iii alone is correct
- 7) The quantity of Gypsum added in cement varies from 2 to 3% will depend upon the quantity of _____.
 - a) C₃A in cement
 - C₃S in cement C)
- b) C4AF in cement
- d) C₃S & C₂S in cement

Max. Marks: 70

Marks: 14

Set

SLR-FM-620

Set S Gypsum consists of _____. 8) H₂S and CO₂ b) CaSO₄ a) Lime and H₂O c) d) CO₂ and calcium 9) If 'P' is the standard consistency of cement, the amount of water used in conduction the initial setting time test on cement is _____. 0.65 P b) 0.85 P a) 0.6 P d) 0.8 P c) The compressive strength of a standard 1:3 port land cement sand mortar 10) after 28 days of curing should not be less than _ 115 kg/cm² 330 kg/cm² a) b) 175 kg/cm^2 210 kg/cm² d) c) 11) The maximum percentage of deleterious material permitted in aggregate is about . 10 7 a) b) c) 3 d) 1 For concrete mix pH value of water shall not be less than _____. 12) 7 a) b) 6 C) 8 d) 9 Consider the following statements: _ 13) Sea water accelerates the setting time of cement i) Sea water accelerates the early strength of cement ii) iii) Factor for corrosion is the use of sea water of these a) i, ii are wrong i alone wrong b) c) ii alone wrong d) All are correct Which of the following fig. represents that the concrete is non-cohesive 14) and shows the characteristic of segregation?

c)

a)

n?

d)

b)

SLR-FM-620

		S.E. (Part – I) (Old) (CGPA) Examination N	lov/Dec-2019
-			
Day a Time	& Da : 10:0	te: Saturday, 07-12-2019 00 AM To 01:00 PM	Max. Marks:
Instr	uctio	 ans: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Use of non-programmable calculator allowed. 4) Assume suitable data if required and mentione 	d clearly.
		Section – I	
Q.2	Wri a) b) c) d)	te notes and draw sketches in support of your ans Compounds of cement Bulkage of fine aggregates Initial setting time and final setting time of cement Methods of curing	wer. (any three)
Q.3	Sol a) b) c) d)	ve any three. Explain effect of temperature on strength of concrete Enlist methods of curing concrete. Write a note on workability and its measure. Write note on super plasticizers.	
Q.4	Wri	e about effect of shape of aggregate on performance OR	of concrete.
	Wri	e on Plasticizers.	
		Section – II	
Q.5	Sol a) b) c)	ve any two. Define Durability and what are the factors affecting d Write a note on ready mix concrete. Explain durability of concrete.	urability of concrete.
Q.6	Des	sign concrete mix of grade M20 by IS method by us	sing following data.
	aj	 Character compressive strength required in the field at 28 days 	20 MPa
		 Maximum size of aggregate Degree of workability 	20 mm (angular) 0.90 compacting factor

No.

Seat

5)

1)

2)

3)

4)

i)

i)

b)

4) Degree of quality control

Specific gravity of cement

Coarse aggregate

Compressive strength of cement at 7 days

ii) Specific gravity of fine aggregates

Specific gravity of coarse aggregates

Type of Exposure

Water absorption

ii) Fine aggregate

Test data for Materials

Set

Max. Marks: 56

S

12

12

04

12

10

Good

Satisfies the requirement

Mild

3.15

2.60

2.60

0.50%

1.0%

5) Free (surface) moisture

i) Coarse aggregate

- ii) Fine aggregate
- **Q.7** Write in details on high performance concrete.

OR

Nil

2.0%

Differentiate between design mix and nominal mix concrete along with the factors governing mix design.





Fig.1 Relationship between Free Water-Cement Ratio and Concrete Strength for Different Cement Strengths (Ref : IS 10262-1982)

06



SLR-FM-620 Set S

Table ⁻	Assumed Star (Ref : IS 456-	ndard Deviation -2002)
SI. No.	Grade of Concrete	Assumed Standard Deviation (N/mm ²)
1	M 10	9 50
2	M 15	- 3.30
. 3	M 20	10
4	M 25	4.0
5	M 30	
6	M 35	•
7	M 40	5.00
8	M 45	
9	M 50	
10	M 55	

(Clauses 4.2, A-5 and B-5)					
SI No.	Nominal Maximum Size of Aggregate	Maximum Water Content ¹⁹			
	mm	kg			
(1)	(2)	(3)			
i)	10	208			
iń	20	186			
iii)	40	165			
LEVET	- These quantities of mi	islaa watar are far use i			

Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate (Clauses 4.4, A-7 and B-7)

Volume of Coarse Aggregate" per Unit SL Nominal Volume of Total Aggregate for No. Maximum Size of Different Zones of Fine Aggregate Aggregate Zone IV mm Zone III Zone II Zoncl (1) (2) (3) (4) (5) (6) i) 10 0.50 0.48 0.46 0.44 20 0.66 0.64 11) 0.62 0.60 40 iii) 0.75 0.73 0.71 0.69 ¹⁵ Volumes are based on aggregates in saturated surface dry condition.

Table & Minimum Cement Content, Maximum Water-Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal Maximum Size

și Na	Represent		Plain Concrete			Reinferred Concret	
		Minimum Cernent Content kg/m ³	Maximum Free Water- Cement Ratio	Minimasa Grade of Councie	Minimum Coment Coatent kg/m ³	Maximum Free Water- Cement Ratio	Minimum Grade of Concrete
1)	(2)	(3)	(4)	(5)	(6)	(T)	(8)
1)	Mild	220	0.60	-	300	0.55	M 20 *
Lill)	Modecate	240	0.60	M 15	300	0.50	M 25
ill)	Severe	250	0.50	M 20	320	0.45	M 30
ir)	Very severe	260	0.45	M 20	340	0.45	M 35
*)	Extreme	280	0.40	M 25	360	0.40	M 40

NOTES 1. Cement content prescribed in this table is irrespective of the grades of cement and it is inclusive of additions mentioned in 5.2. The additions such as fly axh or ground granulated blast furnees sing may be taken into account in the concrete composition with respect to the coment content and water-cement ratio if the suitability is established and as long as the maximum amounts taken into account do not exceed the limits of pozzolona and sing specified in 15 1489 (Part I) and IS 455 respectively.

2 Minimum grade for plain concrete under mild exposure condition is not specified.

	Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
10 mm	100	100	100	100
4·75 mm	90-100	90-100	90-100	95-100
2·36 mm	60-95	75-100	85-100	95-100
1·18 mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15

SLR-FM-620 Set S

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** STRUCTURAL MECHANICS – I

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The bending equation is ____ 1)
 - a) M/I = F/Y = E/Rb) I/M = F/Y = E/Rc) M/I = R/E = F/Yd) M/I = Y/E = E/R

2) The strength of beams mainly depends on

- a) bending moment b) c.g. of the section
- c) section modulus d) its weight
- The Eccentric Vertical Load generates _____. 3)
 - a) Only Direct Stress
 - b) Only Bending Stress
 - c) Combined Bending and Direct Stress
 - d) Shear Stress

4) For no tension in the section, the eccentricity must not exceed .

- a) k^2/d b)
- c) 4k2/d d)

d= depth of section, k= radius of gyration

- 5) When thin cylindrical shell is subjected to internal fluid pressure, which of the following stress is developed in its wall?
 - a) Circumferential stress
 - c) Both a & b d) None of the above
- The angle of twist is _____ proportional to twisting moment. 6)
 - a) directly
 - b) inversely d) none of the above
- The strain energy stored by the body with in elastic limit when loaded 7) externally is called as _____
 - a) resilience proof resilience b)
 - c) modulus of resilience d) none of the above
- 8) In the case of an I-section beam maximum shear stress is at _____.
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b

c) both a & b

d) none of the above



Set

Max. Marks: 70

Marks: 14

b) Longitudinal stress

- k^2/d^2
- $2k^2/d$



- c) either of a and b
- b) parabolicd) cubic
 - Cubic

Set

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

Length=3m Area=300 mm2

A

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.

P

B

2m

3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.

Q

C

Length=5m Area=400 m2

3m

D

100kN



3m





Set P um 09

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250
 O9 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.





Q.9 Find the moment of resistance of a flitched beam with a Timber part of 200mm wide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - I**

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In the case of an I-section beam maximum shear stress is at _____. 1)
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b
 - d) none of the above
- 2) In flitched beam at same level strains in wood and steel should be kept _____.
 - a) equal c) both a and b

- b) unequal d) can't say anything
- The Internal resistance which the body offers to meet the external force 3) or load is called as _____.
 - a) stress b) strain
 - c) pressure d) none of the above
- 4) The ratio of lateral strain to linear strain is known as _
 - a) modulus of elasticity
 - d) c) poisson's ratio
- The relation between E (modulus of elasticity) & C (modulus of rigidity) is 5) given
 - a) E = C(1 + 1/m)c) E = C(1 + 2/m)
- E = 2C (1 + 1/m)b) d) None of these

The point of contra flexure is also called _____ 6)

- a) the point of inflexion
- b) a virtual hinge c) both a and b d) none of the above
- In a cantilever beam with uniformly distributed load shear force varies 7) along the span with following relation _
 - a) linear b) parabolic
 - c) either of a and b d) cubic
- The bending equation is ____ 8) a) M/I = F/Y = E/Rb) I/M = F/Y = E/Rc) M/I = R/E = F/Yd) M/I = Y/E = E/R
- 9) The strength of beams mainly depends on _____ a) bending moment b) c.g. of the section c) section modulus
 - d) its weight



Q

Set

Max. Marks: 70

Marks: 14

- b) modulus of rigidity
- elastic limit

- 10) The Eccentric Vertical Load generates _____.
 - a) Only Direct Stress
 - b) Only Bending Stress
 - c) Combined Bending and Direct Stress
 - d) Shear Stress
- 11) For no tension in the section, the eccentricity must not exceed _____.
 - a) k^2/d b) $2k^2/d$
 - d) k^2/d^2
 - d= depth of section, k= radius of gyration
- 12) When thin cylindrical shell is subjected to internal fluid pressure, which of the following stress is developed in its wall?

b)

- a) Circumferential stress
- b) Longitudinal stress

SLR-FM-621

Set Q

- c) Both a & b
- d) None of the above

inversely

- 13) The angle of twist is _____ proportional to twisting moment.
 - a) directly

c) 4k2/d

- c) both a & b d) none of the above
- 14) The strain energy stored by the body with in elastic limit when loaded externally is called as _____.
 - a) resilience
 - c) modulus of resilience
- b) proof resilience
- d) none of the above

Page 8 of 20

SLR-FM-621

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.

Q



Q.3 Draw Shear Force and Bending Moment diagram for the Beam shown in Figure 09 2 below. Show all the Calculations.





Max. Marks: 56

Set Q um 09

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250
 O9 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.





Q.9 Find the moment of resistance of a flitched beam with a Timber part of 200mm wide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - I**

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- When thin cylindrical shell is subjected to internal fluid pressure, which of 1) the following stress is developed in its wall?
 - a) Circumferential stress c) Both a & b
- b) Longitudinal stress d) None of the above
- 2) The angle of twist is _____ proportional to twisting moment.
 - a) directly inversely b)
 - c) both a & b d) none of the above
- The strain energy stored by the body with in elastic limit when loaded 3) externally is called as _____.
 - a) resilience proof resilience b)
 - c) modulus of resilience d) none of the above
- 4) In the case of an I-section beam maximum shear stress is at
 - a) the junction of the top flange and web
 - b) at neutral axis
 - c) either a or b
 - d) none of the above
- In flitched beam at same level strains in wood and steel should be kept . 5) b) unequal
 - a) equal
 - c) both a and b d) can't say anything
- The Internal resistance which the body offers to meet the external force 6) or load is called as .
 - a) stress c) pressure

- b) strain
- d) none of the above
- 7) The ratio of lateral strain to linear strain is known as _____
 - a) modulus of elasticity modulus of rigidity b) c) poisson's ratio d) elastic limit
- The relation between E (modulus of elasticity) & C (modulus of rigidity) is 8) given _____.
 - a) E = C(1 + 1/m)
 - c) E = C(1 + 2/m)

- b) E = 2C (1 + 1/m)
- d) None of these

R

Set

Max. Marks: 70

		SLR-FM-	·621
		Set	t R
9)	The point of contra flexure is also called a) the point of inflexion b) a virtual hinge c) both a and b d) none of the above	e	
10)	In a cantilever beam with uniformly distributed load shear for along the span with following relation a) linear b) parabolic c) either of a and b d) cubic	orce varies	
11)	The bending equation is a) $M/I = F/Y = E/R$ b) $I/M = F/Y = E/R$ c) $M/I = R/E = F/Y$ d) $M/I = Y/E = E/R$		
12)	The strength of beams mainly depends ona) bending momentb) c.g. of the sectionc) section modulusd) its weight	1	
13)	 The Eccentric Vertical Load generates a) Only Direct Stress b) Only Bending Stress c) Combined Bending and Direct Stress d) Shear Stress 		
14)	For no tension in the section, the eccentricity must not exce a) k^2/d b) $2k^2/d$ c) $4k2/d$ d) k^2/d^2	eed	

d= depth of section, k= radius of gyration

Max. Marks: 56

Seat No. S.E. (Part – I) (Old) (CGPA) Ex

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

Length=3m Area=300 mm2

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.

P

3) Assume suitable data is necessary and mention it clearly

Section – I

Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.

Q

Length=5m Area=400 m2





Set R

Set R um 09

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250 09 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.





line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable

stress in steel. Take E_{steel}=20E_{timber}

Q.9

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

STRUCTURAL MECHANICS - I

Day & Date: Tuesday, 10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1

Choose the correct alternatives from the options and rewrite the sentence. 14

- The Internal resistance which the body offers to meet the external force 1) or load is called as .
 - stress a)

c) pressure

- b) strain d) none of the above
- 2) The ratio of lateral strain to linear strain is known as
 - modulus of rigidity b)
 - a) modulus of elasticity c) poisson's ratio
- d) elastic limit

The relation between E (modulus of elasticity) & C (modulus of rigidity) is 3) given _____.

a) E = C(1 + 1/m)

c) both a and b

- b) E = 2C (1 + 1/m)None of these c) E = C(1 + 2/m)d)
- 4) The point of contra flexure is also called
 - a) the point of inflexion
- a virtual hinge b) d) none of the above
- In a cantilever beam with uniformly distributed load shear force varies 5)
 - along the span with following relation _ a) linear b) parabolic
 - c) either of a and b cubic d)

The bending equation is _____. 6)

- a) M/I = F/Y = E/Rb) I/M = F/Y = E/R
- c) M/I = R/E = F/YM/I = Y/E = E/Rd)
- 7) The strength of beams mainly depends on _____
 - a) bending moment b) c.g. of the section
 - c) section modulus d) its weight
- The Eccentric Vertical Load generates _____. 8)
 - a) Only Direct Stress
 - b) Only Bending Stress
 - c) Combined Bending and Direct Stress
 - d) Shear Stress

Max. Marks: 70

Marks: 14

Set



- d) none of the above
- 14) In flitched beam at same level strains in wood and steel should be kept _____.
 - a) equal
 - c) both a and b

- b) unequal
- d) can't say anything

Set S

Set

S

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - I

Day & Date: Tuesday,10-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q.No.6 are compulsory.

- 2) Solve any two question of each section.
- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data is necessary and mention it clearly

Section – I

- Q.2 A rigid bar ABCD is supported and loaded as shown in Figure 1. The suspender 10 rod PB is 3m long with 300mm² cross sectional area whereas suspender rod QC is 5 long with cross sectional area of 400mm². Find the stresses induced in the suspender rods. Assume that suspender rods are of same materials.
 - Q 11 P Length=5m Area=400 m2 Length=3m Area=300 mm2 B C D 3m 2m 3m A 100kN Figure 1
- Q.3 Draw Shear Force and Bending Moment diagram for the Beam shown in Figure 09 2 below. Show all the Calculations.





Set <u>S</u>

Q.4 If maximum permissible stress in the material is 30N/mm², Find the maximum UDL on a Simply Supported Beam of 5m long for the T-Section cross sectional details of beam given in Figure 3 below.



Q.5 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m³ and masonry as 20kN/m³.

Section – II

Q.6 Answer the following questions.

- a) Flitched beam
- b) Define terms proof resilience & modulus of resilience.
- c) Explain the term equivalent section.
- d) Circumferential and Longitudinal Stress in Thin Cylinders.
- e) Expression for Strain Energy due to bending.
- Q.7 A steel beam of I section shown in Figure 4 is 600 mm deep. Each flange is 250
 O9 mm wide & 25 mm thick. The web is 15 mm thick. The beam section is subjected to a shear force of 500 KN. Determine shear stress distribution for the beam section at various levels.







- Q.8 A solid circular shaft transmits 75 KW power at 200 r.p.m. Calculate the shaft 09 diameter, if the twist in the shaft is not to exceed 1⁰ in 2 meters length of the shaft & shear stress is limited to 50 N/mm², Take C=100 x 10³N/mm²
- Find the moment of resistance of a flitched beam with a Timber part of 200mm Q.9 09 wide and 250mm deep reinforced with two flitches each side by 200mm by 15mm in section. Horizontal CG of timber and steel part passes through same line. Consider allowable stress in timber is 6.5 N/mm² and also find allowable stress in steel. Take E_{steel}=20E_{timber}

Set

Max. Marks: 70

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019

Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The value of the magnetic declination at a place is $7^{0}20^{\circ}$ W. which out of 1) following will be true bearing of a line whose magnetic bearing is S45⁰40'W? S38⁰20'W b)
 - a) S53⁰W
 - N53⁰E None of the above c) d)

2) The operation of levelling across a river is termed as

- Profile Levelling a)
- **Reciprocal Levelling** b)

None of the above

- Simple Levelling c)
- d) **Differential Levelling** The permissible angular error for a sixteen sided closed traverse with 3)
 - vernier theodolite having 20" least count will be 320" 80" a) b)
 - 160" d) c)
- 4) The nautical sextant is used for
 - a) Measurement of horizontal angle
 - Measurement of vertical angle b)
 - C) Measurement of magnetic bearing
 - d) None of the above

If algebraic sum of latitude is negative, the correction in northing will 5) be

- positive a) b) negative
- c) Either positive or negative d) None of the above
- During trigonometrical leveling, the horizontal and vertical angle measurements 6) are essential, in case of _____
 - Object is accessible from theodolite station a)
 - b) Object is inaccessible but object and both instrument stations are in same vertical plane
 - Object is inaccessible but object and both instrument stations are in C) different vertical plane
 - None of the above d)
- Sounding rods are used in 7)
 - Shallow depth of water a)
 - In deep water C)
- b) Medium depth of water
- All of the above d)

Marks: 14

				Set	Ρ
8)	Tellurometer propagation c a) Visible lig c) Both	is an electronic distance If ght waves	e mea b) d)	suring device that employs the Radio waves None of these	
9)	To avoid the c a) Magnetic c) Trial and	effect of local attraction compass error	the pl b) d)	ane table is oriented by Backsight None of these	
10)	During orienta a) the farthe c) either (a)	ation of plane table eset point is sighted or (b)	b) d)	the nearest point is sighted the previous station is sighted	
11)	In which of re a) Two poir c) both a ar	section method an auxi it problem າd b	liary s b) d)	tation is not required? Three point problem none of these	
12)	Contour lines a) vertical c c) Horizonta	of different Reduced le liff al surface	vels n b) d)	neeting at a point indicate overhanging cliff All of these	_ .
13)	One hectare (a) 10^2 m^2 c) 10^6 m^2	of an area equivalent to	b) d)	 10 ⁴ m ² 10 ³ m ²	
14)	To obtain the correction sho a) added c) multiplied	correct volume using th ould always be	ne trap b) d)	bezoidal rule the prismoidal subtracted both a or b	

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) Q no.2 and Q.No.6 are compulsory.

- 2) Attempt any two from the remaining questions of each section.
- 3) Figures to right indicate full marks.
- 4) Assume suitable data if necessary and mention it clearly.

Section - I

- **Q.2** a) An observer standing on the deck of a ship just sees a light house; the top 04 of the light house is 28m above the sea level and the height of the observer's eye 12m above the sea level. Find the distance of the observer from the light house.
 - b) The following notes refer to the reciprocal levels taken with the level:

Instrument station	Readings on		Pomarka	
	А	В	Remarks	
А	1.029	1.634	Distance (AB)=800m	
В	0.943	1.542	RL of A = 421.543	

Find

- the true R.L. of B i)
- combined corrections for curvature and refraction ii)

- the error in collimation adjustment of the adjustment iii)
- A theodolite was set up at a distance of 200m from a chimney and the Q.3 04 a) angle of elevation to its top was 10⁰48'. The staff reading on bench mark of reduced level 70.25m with telescope horizontal was 0.977. Find the Reduced level of top of the chimney.
 - b) The following are the length and bearing of the sides of a closed transverse 05 ABCDA.

Line	Length(m)	Bearin
AB	78.2	140 ⁰ 12
BC	198.0	36 ⁰ 24
CD	37.8	338 ⁰ 48
DA	?	?

Calculate the length and bearing of DA.

SLR-FM-622

Set

Max. Marks: 56



04

09

Q.4 a) The following table given the latitude and departure of the sides of a closed **05** traverse ABCDA.

Lino	Latitude (m)		Departure (m)	
Line	N	S	E	W
AB	107.4		62.0	
BC		122.6	102.9	
CD		77.9		45
DA	93.1			119.9

Assuming independent coordinate of A as 200(N) and 100(E), calculate the independent coordinates of remaining stations.

b) What are the fundamental axes of vernier theodolite? State the desired relationship between them?

Q.5 Write short notes.

- a) Sounding
- **b)** Abony Level
- c) Hand Level

Section – II

- Q.6 a) Construction and use of total station. 04 An embankment of width 10m of slide slopes $1\frac{1}{2}$: 1 is required to be made 06 b) on ground which is level in a direction transeverse to the centre line. The central heights at 40m at interval as follows-0.90, 1.25, 2.15, 2.50, 1.85, 1.35 & 0.85 calculate the volume of earth work according to 1) The trapezoidal formula The prismoidal formula 2) Q.7 a) What are the methods of plane tabling? Describe one of them with sketch. 05 b) What is three point problems? How it is solved by Mechanical method. 04 Q.8 a) What are the different methods of contouring? Describe any one method 05 with neat sketch. **b)** The following perpendicular offsets were taken from chain line to hedge. 04 Distance(m) 0 6 12 18 24 30 36 2.25 Offset(m) 5.40 4.50 3.60 2.70 1.80 3.15 Calculate the area enclosed between chain line and offsets by 1) trapezoidal rule Simpson's rule 2)
- Q.9 a) Write short note on "co-ordinate method".
 - **b)** Write note on Geodimeter.

05
S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering

SURVEYING - I

Day & Date: Thursday, 12-12-2019

Duration: 30 Minutes

c)

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Assume suitable data if necessary but mention it clearly.
- Figures to right indicate full marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 Tellurometer is an electronic distance measuring device that employs the 1)

propagation of ____ Visible light waves a)

Both

- b) Radio waves
- d) None of these

the nearest point is sighted

Three point problem

none of these

the previous station is sighted

2) To avoid the effect of local attraction the plane table is oriented by _____. Backsight

b)

b)

d)

- a) Magnetic compass
- Trial and error None of these d) C)

3) During orientation of plane table

- the fartheset point is sighted b) a) d)
- either (a) or (b) C)
- In which of resection method an auxiliary station is not required? 4)
 - Two point problem a)
 - both a and b C)
- Contour lines of different Reduced levels meeting at a point indicate _____. 5)
 - overhanging cliff vertical cliff a) b)
 - All of these Horizontal surface d) C)

One hectare of an area equivalent to 6) $10^4 \, m^2$ $10^{2} \, m^{2}$ a) b)

- $10^{6} \, \text{m}^{2}$ $10^3 \, \text{m}^2$ c) d)
- To obtain the correct volume using the trapezoidal rule the prismoidal 7) correction should always be ____
 - added b) subtracted a) C) multiplied d) both a or b
- The value of the magnetic declination at a place is $7^{0}20^{\circ}$ W. which out of 8) following will be true bearing of a line whose magnetic bearing is S45⁰40'W?
 - S38⁰20'W S53⁰W a) b) N53⁰E c)
 - None of the above d)
- 9) The operation of levelling across a river is termed as
 - Profile Levelling **Reciprocal Levelling** b) a)
 - Simple Levelling d) **Differential Levelling** C)

Seat No.

SLR-FM-622

Set Q

Max. Marks: 70

Marks: 14

10) The permissible angular error for a sixteen sided closed traverse with vernier theodolite having 20" least count will be _____.

- 320"
- c) 160"
- b) 80"d) None of the above

SLR-FM-622

Set Q

- 11) The nautical sextant is used for ____
 - a) Measurement of horizontal angle
 - b) Measurement of vertical angle
 - c) Measurement of magnetic bearing
 - d) None of the above
- 12) If algebraic sum of latitude is negative, the correction in northing will

be _____. a) positive

a)

b) negative

_.

- c) Either positive or negative d) None of the above
- 13) During trigonometrical leveling, the horizontal and vertical angle measurements are essential, in case of _____.
 - a) Object is accessible from theodolite station
 - b) Object is inaccessible but object and both instrument stations are in same vertical plane
 - c) Object is inaccessible but object and both instrument stations are in different vertical plane
 - d) None of the above
- 14) Sounding rods are used in _____.
 - a) Shallow depth of water
 - c) In deep water

- b) Medium depth of water
- d) All of the above

Seat No.

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q no.2 and Q.No.6 are compulsory.

- 2) Attempt any two from the remaining questions of each section.
- 3) Figures to right indicate full marks.
- 4) Assume suitable data if necessary and mention it clearly.

Section - I

- **Q.2** a) An observer standing on the deck of a ship just sees a light house; the top 04 of the light house is 28m above the sea level and the height of the observer's eye 12m above the sea level. Find the distance of the observer from the light house.
 - **b)** The following notes refer to the reciprocal levels taken with the level:

Instrument station	Readings on		Bomorko	
	А	В	Remarks	
A	1.029	1.634	Distance (AB)=800m	
В	0.943	1.542	RL of A = 421.543	

Find

- the true R.L. of B i)
- combined corrections for curvature and refraction ii)
- the error in collimation adjustment of the adjustment iii)
- A theodolite was set up at a distance of 200m from a chimney and the Q.3 04 a) angle of elevation to its top was 10⁰48'. The staff reading on bench mark of reduced level 70.25m with telescope horizontal was 0.977. Find the Reduced level of top of the chimney.
 - **b)** The following are the length and bearing of the sides of a closed transverse 05 ABCDA.

Line	Length(m)	Bearing
AB	78.2	140 ⁰ 12'
BC	198.0	36 ⁰ 24'
CD	37.8	338 ⁰ 48'
DA	?	?

Calculate the length and bearing of DA.



Max. Marks: 56



04

09

Q.4 a) The following table given the latitude and departure of the sides of a closed **05** traverse ABCDA.

Lino	Latitude (m)		Departure (m)	
Line	N	S	E	W
AB	107.4		62.0	
BC		122.6	102.9	
CD		77.9		45
DA	93.1			119.9

Assuming independent coordinate of A as 200(N) and 100(E), calculate the independent coordinates of remaining stations.

b) What are the fundamental axes of vernier theodolite? State the desired relationship between them?

Q.5 Write short notes.

- a) Sounding
- **b)** Abony Level
- c) Hand Level

Section – II

- Q.6 a) Construction and use of total station. 04 An embankment of width 10m of slide slopes 11/2 : 1 is required to be made 06 b) on ground which is level in a direction transeverse to the centre line. The central heights at 40m at interval as follows-0.90, 1.25, 2.15, 2.50, 1.85, 1.35 & 0.85 calculate the volume of earth work according to 1) The trapezoidal formula The prismoidal formula 2) Q.7 a) What are the methods of plane tabling? Describe one of them with sketch. 05 b) What is three point problems? How it is solved by Mechanical method. 04 Q.8 a) What are the different methods of contouring? Describe any one method 05 with neat sketch. **b)** The following perpendicular offsets were taken from chain line to hedge. 04 Distance(m) 0 6 12 18 24 30 36 Offset(m) 5.40 4.50 3.60 2.70 1.80 2.25 3.15 Calculate the area enclosed between chain line and offsets by 1) trapezoidal rule Simpson's rule 2)
- Q.9 a) Write short note on "co-ordinate method".
 - **b)** Write note on Geodimeter.

SLR-FM-622 Set

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019

Time: 10:00 AM To 01:00 PM

Duration: 30 Minutes

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data if necessary but mention it clearly.
- Figures to right indicate full marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- 1) If algebraic sum of latitude is negative, the correction in northing will
 - be _____.
 - positive a) c)
 - Either positive or negative
- b) negative d) None of the above
- During trigonometrical leveling, the horizontal and vertical angle measurements 2) are essential, in case of
 - Object is accessible from theodolite station a)
 - Object is inaccessible but object and both instrument stations are in b) same vertical plane
 - Object is inaccessible but object and both instrument stations are in c) different vertical plane
 - None of the above d)
- 3) Sounding rods are used in
 - Shallow depth of water a) In deep water c)
- b) Medium depth of water d) All of the above
- Tellurometer is an electronic distance measuring device that employs the 4) propagation of ____
 - a) Visible light waves
 - b) Radio waves C) Both d) None of these

To avoid the effect of local attraction the plane table is oriented by _____. 5)

- Magnetic compass **Backsight** b) a)
 - Trial and error c) d) None of these
- 6) During orientation of plane table
 - the fartheset point is sighted b) the nearest point is sighted a) the previous station is sighted either (a) or (b)
 - c) d)
- 7) In which of resection method an auxiliary station is not required? Three point problem b)
 - Two point problem a) both a and b C)
- none of these d)
- Contour lines of different Reduced levels meeting at a point indicate _____. 8)
 - a) vertical cliff overhanging cliff b)
 - c) Horizontal surface d) All of these

Max. Marks: 70

Marks: 14

14

R

SLR-FM-622 Set | R

- 9) One hectare of an area equivalent to
 - $10^4 \, m^2$ $10^2 \, {\rm m}^2$ b) a) $10^{6} \, \text{m}^{2}$ $10^3 \, \text{m}^2$ C) d)
- To obtain the correct volume using the trapezoidal rule the prismoidal 10) correction should always be ____
 - a) added

Profile Levelling

c)

a)

- b) subtracted multiplied d) both a or b
- The value of the magnetic declination at a place is $7^{0}20^{\circ}$ W. which out of 11) following will be true bearing of a line whose magnetic bearing is S45⁰40'W? S38⁰20'W
 - S53⁰W a) b) N53⁰E C)
 - None of the above d)
- 12) The operation of levelling across a river is termed as _
 - **Reciprocal Levelling** b)
 - Simple Levelling d) **Differential Levelling** c)
- The permissible angular error for a sixteen sided closed traverse with 13) vernier theodolite having 20" least count will be
 - a) 320" b)
 - C) 160"

- 80"
- d) None of the above
- 14) The nautical sextant is used for _____.
 - Measurement of horizontal angle a)
 - Measurement of vertical angle b)
 - Measurement of magnetic bearing c)
 - None of the above d)

Seat No.

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering SURVEYING – I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q no.2 and Q.No.6 are compulsory.

- 2) Attempt any two from the remaining questions of each section.
- 3) Figures to right indicate full marks.
- 4) Assume suitable data if necessary and mention it clearly.

Section – I

- Q.2 a) An observer standing on the deck of a ship just sees a light house; the top 04 of the light house is 28m above the sea level and the height of the observer's eye 12m above the sea level. Find the distance of the observer from the light house.
 - b) The following notes refer to the reciprocal levels taken with the level:

06

Instrument station	Readings on		Remarks	
	A B			
A	1.029	1.634	Distance (AB)=800m	
В	0.943	1.542	RL of A = 421.543	

Find

- i) the true R.L. of B
- ii) combined corrections for curvature and refraction
- iii) the error in collimation adjustment of the adjustment
- Q.3 a) A theodolite was set up at a distance of 200m from a chimney and the angle of elevation to its top was 10⁰48'. The staff reading on bench mark of reduced level 70.25m with telescope horizontal was 0.977. Find the Reduced level of top of the chimney.
 - b) The following are the length and bearing of the sides of a closed transverse 05 ABCDA.

Line	Length(m)	Bearing
AB	78.2	140 ⁰ 12'
BC	198.0	36 ⁰ 24'
CD	37.8	338 ⁰ 48'
DA	?	?

Calculate the length and bearing of DA.



Max. Marks: 56



04

09

Q.4 a) The following table given the latitude and departure of the sides of a closed **05** traverse ABCDA.

Lino	Latitude (m)		Departure (m)	
Line	N	S	E	W
AB	107.4		62.0	
BC		122.6	102.9	
CD		77.9		45
DA	93.1			119.9

Assuming independent coordinate of A as 200(N) and 100(E), calculate the independent coordinates of remaining stations.

b) What are the fundamental axes of vernier theodolite? State the desired relationship between them?

Q.5 Write short notes.

- a) Sounding
- **b)** Abony Level
- c) Hand Level

Section – II

- Q.6 a) Construction and use of total station. 04 An embankment of width 10m of slide slopes 11/2 : 1 is required to be made 06 b) on ground which is level in a direction transeverse to the centre line. The central heights at 40m at interval as follows-0.90, 1.25, 2.15, 2.50, 1.85, 1.35 & 0.85 calculate the volume of earth work according to 1) The trapezoidal formula The prismoidal formula 2) Q.7 a) What are the methods of plane tabling? Describe one of them with sketch. 05 b) What is three point problems? How it is solved by Mechanical method. 04 Q.8 a) What are the different methods of contouring? Describe any one method 05 with neat sketch. **b)** The following perpendicular offsets were taken from chain line to hedge. 04 Distance(m) 0 6 12 18 24 30 36 Offset(m) 5.40 4.50 3.60 2.70 1.80 2.25 3.15 Calculate the area enclosed between chain line and offsets by 1) trapezoidal rule Simpson's rule 2)
- **Q.9** a) Write short note on "co-ordinate method".
 - **b)** Write note on Geodimeter.

04

Seat No.

Q.1

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - I

Day & Date: Thursday, 12-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Assume suitable data if necessary but mention it clearly.
- Figures to right indicate full marks.

MCQ/Objective Type Questions Duration: 30 Minutes Marks: 14 Choose the correct alternatives from the options and rewrite the sentence. 14 During orientation of plane table 1) the fartheset point is sighted b) the nearest point is sighted a) the previous station is sighted either (a) or (b) c) d) 2) In which of resection method an auxiliary station is not required? Two point problem Three point problem a) b) C) both a and b d) none of these 3) Contour lines of different Reduced levels meeting at a point indicate _____. a) vertical cliff overhanging cliff b) All of these Horizontal surface d) c) 4) One hectare of an area equivalent to $10^2 \, \text{m}^2$ $10^4 \, \text{m}^2$ a) b) 10^{6} m^{2} 10^{3} m^{2} d) C) To obtain the correct volume using the trapezoidal rule the prismoidal 5) correction should always be added a) b) subtracted multiplied C) d) both a or b The value of the magnetic declination at a place is $7^{0}20^{\circ}$ W. which out of 6) following will be true bearing of a line whose magnetic bearing is S45⁰40'W? S38⁰20'W a) S53⁰W b) N53⁰E None of the above c) d) 7) The operation of levelling across a river is termed as _____ Profile Levelling **Reciprocal Levelling** b) a) c) Simple Levelling d) **Differential Levelling** The permissible angular error for a sixteen sided closed traverse with 8) vernier theodolite having 20" least count will be 80" 320" a) b) 160" d) None of the above C)

Max. Marks: 70

Set

The nautical sextant is used for _____.

- Measurement of horizontal angle a)
- Measurement of vertical angle b)
- Measurement of magnetic bearing c)
- None of the above d)
- 10) If algebraic sum of latitude is negative, the correction in northing will
 - be _____. positive a)

C)

c)

c)

9)

b) negative

None of the above

SLR-FM-622

Set S

- Either positive or negative d) c)
- 11) During trigonometrical leveling, the horizontal and vertical angle measurements are essential, in case of ____
 - Object is accessible from theodolite station a)
 - Object is inaccessible but object and both instrument stations are in b) same vertical plane
 - Object is inaccessible but object and both instrument stations are in c) different vertical plane
 - None of the above d)
- 12) Sounding rods are used in _____
 - Shallow depth of water a) In deep water
- b) Medium depth of water All of the above d)
- Tellurometer is an electronic distance measuring device that employs the 13) propagation of
 - a) Visible light waves
- b) Radio waves
- Both
- d) None of these
- 14) To avoid the effect of local attraction the plane table is oriented by _____.
 - Magnetic compass a)
- b) Backsight None of these
- Trial and error d)

Set

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering SURVEYING – I

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q no.2 and Q.No.6 are compulsory.

- 2) Attempt any two from the remaining questions of each section.
- 3) Figures to right indicate full marks.
- 4) Assume suitable data if necessary and mention it clearly.

Section – I

- Q.2 a) An observer standing on the deck of a ship just sees a light house; the top of the light house is 28m above the sea level and the height of the observer's eye 12m above the sea level. Find the distance of the observer from the light house.
 - **b)** The following notes refer to the reciprocal levels taken with the level:

Instrument station	Readings on		Bomorko	
	А	В	Remarks	
A	1.029	1.634	Distance (AB)=800m	
В	0.943	1.542	RL of A = 421.543	

Find

- i) the true R.L. of B
- ii) combined corrections for curvature and refraction
- iii) the error in collimation adjustment of the adjustment
- Q.3 a) A theodolite was set up at a distance of 200m from a chimney and the angle of elevation to its top was 10⁰48'. The staff reading on bench mark of reduced level 70.25m with telescope horizontal was 0.977. Find the Reduced level of top of the chimney.
 - b) The following are the length and bearing of the sides of a closed transverse 05 ABCDA.

Line	Length(m)	Bearing
AB	78.2	140 ⁰ 12'
BC	198.0	36 ⁰ 24'
CD	37.8	338 ⁰ 48'
DA	?	?

Calculate the length and bearing of DA.

Seat No.

SLR-FM-622

Max. Marks: 56

Set S



04

09

Q.4 a) The following table given the latitude and departure of the sides of a closed **05** traverse ABCDA.

Lino	Latitude (m)		Departure (m)	
Line	N	S	E	W
AB	107.4		62.0	
BC		122.6	102.9	
CD		77.9		45
DA	93.1			119.9

Assuming independent coordinate of A as 200(N) and 100(E), calculate the independent coordinates of remaining stations.

b) What are the fundamental axes of vernier theodolite? State the desired relationship between them?

Q.5 Write short notes.

- a) Sounding
- **b)** Abony Level
- c) Hand Level

Section – II

- Q.6 a) Construction and use of total station. 04 An embankment of width 10m of slide slopes 11/2 : 1 is required to be made 06 b) on ground which is level in a direction transeverse to the centre line. The central heights at 40m at interval as follows-0.90, 1.25, 2.15, 2.50, 1.85, 1.35 & 0.85 calculate the volume of earth work according to 1) The trapezoidal formula The prismoidal formula 2) Q.7 a) What are the methods of plane tabling? Describe one of them with sketch. 05 b) What is three point problems? How it is solved by Mechanical method. 04 Q.8 a) What are the different methods of contouring? Describe any one method 05 with neat sketch. **b)** The following perpendicular offsets were taken from chain line to hedge. 04 Distance(m) 0 6 12 18 24 30 36 Offset(m) 5.40 4.50 3.60 2.70 1.80 2.25 3.15 Calculate the area enclosed between chain line and offsets by 1) trapezoidal rule Simpson's rule 2)
- Q.9 a) Write short note on "co-ordinate method".
 - **b)** Write note on Geodimeter.

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 State whether following statement is correct or incorrect.

- 1) Shallow foundation is suitable in black cotton soil.
- 2) The lowest part of a structure which transmits the load to the soil is known as super structure.
- 3) Standard size of brick is 19cmX9mX9cm.
- 4) Ashlar masonry is the type of brick masonry.
- 5) Rail is nothing but the top horizontal member of frame.
- 6) Mullion divides door or window vertically.
- 7) A sloping roof having slope in four directions is called Gambrel roof.
- 8) Rise is vertical member of step which connected to trades.
- 9) Height of plinth always kept less than 450mm for residential building.
- 10) Horn is extensions of post of frame below finished floor level.
- 11) Positive pressure is created on the windward side.
- 12) Frog is special surface texture provided to the stone in stone masonry.
- 13) The economical angle of inclination of louver is 30° .
- 14) Construction speed of load bearing structure is more as compare to the framed structure.



Max. Marks: 70

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Section I to be written in answer book.
- 3) Section II to be drawn on half empirical drawing sheet. Use both sides of the sheet.
- 4) Retain all projection/construction lines on drawing sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Figure to right indicate full marks.

Section – I

Q.2 Attempt any seven questions from following

- a) Write good requirements of stone and its properties.
- **b)** Define foundation, enlist types of foundation and explain any one types of foundation.
- c) Write note on brick masonry and its classification.
- d) Write properties and uses of brick.
- e) Discuss the functional requirements of building.
- f) Compare the Load bearing structure and framed structure.
- g) Explain the load transferring mechanism of framed structure.
- h) Explain the factors of selection of flooring and enlist types of flooring.
- i) Draw a detailed labeled diagram of arch and explain components of arch.
- j) Explain types of Roofs.

Section – II

Q.3 Attempt any two questions from following.

- a) Design and draw doglegged staircase for residential building, use following details.
 - 1) Width of flight 1000mm
 - 2) Floor to floor height 3000 mm, assume suitable data and mention it clearly. Also mention step by step calculation.
- **b)** Draw the front elevation and sectional plan of fully paneled door. Consider following details.
 - Clearing opening 1000mm X 2100mm
 - Frame 100mm X 85mm, Style 100mm X 30mm
 - Top Rail 100mm X 30mm, Bottom rail 150mm X 30 mm,
 - Lock rail 200mm X 30mm, Panel 25mm thick.
 - Assume suitable data and mention it clearly.
- c) Draw elevation and plan (1, 3, 5... and 2, 4, 6... courses) of Flemish bond for L shaped $1\frac{1}{2}$ Brick thick Wall upto 8 courses. Use nominal size brick.

Max. Marks: 56

28

28

Set

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 State whether following statement is correct or incorrect.

- 1) Rise is vertical member of step which connected to trades.
- 2) Height of plinth always kept less than 450mm for residential building.
- 3) Horn is extensions of post of frame below finished floor level.
- 4) Positive pressure is created on the windward side.
- 5) Frog is special surface texture provided to the stone in stone masonry.
- 6) The economical angle of inclination of louver is 30° .
- 7) Construction speed of load bearing structure is more as compare to the framed structure.
- 8) Shallow foundation is suitable in black cotton soil.
- 9) The lowest part of a structure which transmits the load to the soil is known as super structure.
- 10) Standard size of brick is 19cmX9mX9cm.
- 11) Ashlar masonry is the type of brick masonry.
- 12) Rail is nothing but the top horizontal member of frame.
- 13) Mullion divides door or window vertically.
- 14) A sloping roof having slope in four directions is called Gambrel roof.



Max. Marks: 70

Set

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Section I to be written in answer book.
- 3) Section II to be drawn on half empirical drawing sheet. Use both sides of the sheet.
- 4) Retain all projection/construction lines on drawing sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Figure to right indicate full marks.

Section – I

Q.2 Attempt any seven questions from following

- a) Write good requirements of stone and its properties.
- **b)** Define foundation, enlist types of foundation and explain any one types of foundation.
- c) Write note on brick masonry and its classification.
- d) Write properties and uses of brick.
- e) Discuss the functional requirements of building.
- f) Compare the Load bearing structure and framed structure.
- g) Explain the load transferring mechanism of framed structure.
- **h**) Explain the factors of selection of flooring and enlist types of flooring.
- i) Draw a detailed labeled diagram of arch and explain components of arch.
- j) Explain types of Roofs.

Section – II

Q.3 Attempt any two questions from following.

- a) Design and draw doglegged staircase for residential building, use following details.
 - 1) Width of flight 1000mm
 - 2) Floor to floor height 3000 mm, assume suitable data and mention it clearly. Also mention step by step calculation.
- **b)** Draw the front elevation and sectional plan of fully paneled door. Consider following details.
 - Clearing opening 1000mm X 2100mm
 - Frame 100mm X 85mm, Style 100mm X 30mm
 - Top Rail 100mm X 30mm, Bottom rail 150mm X 30 mm,
 - Lock rail 200mm X 30mm, Panel 25mm thick.
 - Assume suitable data and mention it clearly.
- c) Draw elevation and plan (1, 3, 5... and 2, 4, 6... courses) of Flemish bond for L shaped $1\frac{1}{2}$ Brick thick Wall upto 8 courses. Use nominal size brick.

Max. Marks: 56

28

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Marks: 14

Q.1 State whether following statement is correct or incorrect.

- 1) Rail is nothing but the top horizontal member of frame.
- 2) Mullion divides door or window vertically.
- 3) A sloping roof having slope in four directions is called Gambrel roof.
- 4) Rise is vertical member of step which connected to trades.
- 5) Height of plinth always kept less than 450mm for residential building.
- 6) Horn is extensions of post of frame below finished floor level.
- 7) Positive pressure is created on the windward side.
- 8) Frog is special surface texture provided to the stone in stone masonry.
- 9) The economical angle of inclination of louver is 30° .
- 10) Construction speed of load bearing structure is more as compare to the framed structure.
- 11) Shallow foundation is suitable in black cotton soil.
- 12) The lowest part of a structure which transmits the load to the soil is known as super structure.
- 13) Standard size of brick is 19cmX9mX9cm.
- 14) Ashlar masonry is the type of brick masonry.



Max. Marks: 70

Set

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Section I to be written in answer book.
- 3) Section II to be drawn on half empirical drawing sheet. Use both sides of the sheet.
- 4) Retain all projection/construction lines on drawing sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Figure to right indicate full marks.

Section – I

Q.2 Attempt any seven questions from following

- a) Write good requirements of stone and its properties.
- **b)** Define foundation, enlist types of foundation and explain any one types of foundation.
- c) Write note on brick masonry and its classification.
- d) Write properties and uses of brick.
- e) Discuss the functional requirements of building.
- f) Compare the Load bearing structure and framed structure.
- g) Explain the load transferring mechanism of framed structure.
- **h**) Explain the factors of selection of flooring and enlist types of flooring.
- i) Draw a detailed labeled diagram of arch and explain components of arch.
- j) Explain types of Roofs.

Section – II

Q.3 Attempt any two questions from following.

- a) Design and draw doglegged staircase for residential building, use following details.
 - 1) Width of flight 1000mm
 - 2) Floor to floor height 3000 mm, assume suitable data and mention it clearly. Also mention step by step calculation.
- **b)** Draw the front elevation and sectional plan of fully paneled door. Consider following details.
 - Clearing opening 1000mm X 2100mm
 - Frame 100mm X 85mm, Style 100mm X 30mm
 - Top Rail 100mm X 30mm, Bottom rail 150mm X 30 mm,
 - Lock rail 200mm X 30mm, Panel 25mm thick.
 - Assume suitable data and mention it clearly.
- c) Draw elevation and plan (1, 3, 5... and 2, 4, 6... courses) of Flemish bond for L shaped $1\frac{1}{2}$ Brick thick Wall upto 8 courses. Use nominal size brick.

Max. Marks: 56

28

Set

Max. Marks: 70

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 02:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 State whether following statement is correct or incorrect.

- 1) Horn is extensions of post of frame below finished floor level.
- 2) Positive pressure is created on the windward side.
- 3) Frog is special surface texture provided to the stone in stone masonry.
- 4) The economical angle of inclination of louver is 30° .
- 5) Construction speed of load bearing structure is more as compare to the framed structure.
- 6) Shallow foundation is suitable in black cotton soil.
- 7) The lowest part of a structure which transmits the load to the soil is known as super structure.
- 8) Standard size of brick is 19cmX9mX9cm.
- 9) Ashlar masonry is the type of brick masonry.
- 10) Rail is nothing but the top horizontal member of frame.
- 11) Mullion divides door or window vertically.
- 12) A sloping roof having slope in four directions is called Gambrel roof.
- 13) Rise is vertical member of step which connected to trades.
- 14) Height of plinth always kept less than 450mm for residential building.



S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

BUILDING CONSTRUCTION & DRAWING

Day & Date: Saturday, 14-12-2019

Time: 10:00 AM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Section I to be written in answer book.
- 3) Section II to be drawn on half empirical drawing sheet. Use both sides of the sheet.
- 4) Retain all projection/construction lines on drawing sheet.
- 5) Assume suitable data wherever necessary and mention it clearly.
- 6) Figure to right indicate full marks.

Section – I

Q.2 Attempt any seven questions from following

- a) Write good requirements of stone and its properties.
- **b)** Define foundation, enlist types of foundation and explain any one types of foundation.
- c) Write note on brick masonry and its classification.
- d) Write properties and uses of brick.
- e) Discuss the functional requirements of building.
- f) Compare the Load bearing structure and framed structure.
- g) Explain the load transferring mechanism of framed structure.
- h) Explain the factors of selection of flooring and enlist types of flooring.
- i) Draw a detailed labeled diagram of arch and explain components of arch.
- j) Explain types of Roofs.

Section – II

Q.3 Attempt any two questions from following.

- a) Design and draw doglegged staircase for residential building, use following details.
 - 1) Width of flight 1000mm
 - 2) Floor to floor height 3000 mm, assume suitable data and mention it clearly. Also mention step by step calculation.
- **b)** Draw the front elevation and sectional plan of fully paneled door. Consider following details.
 - Clearing opening 1000mm X 2100mm
 - Frame 100mm X 85mm, Style 100mm X 30mm
 - Top Rail 100mm X 30mm, Bottom rail 150mm X 30 mm,
 - Lock rail 200mm X 30mm, Panel 25mm thick.
 - Assume suitable data and mention it clearly.
- c) Draw elevation and plan (1, 3, 5... and 2, 4, 6... courses) of Flemish bond for L shaped $1\frac{1}{2}$ Brick thick Wall upto 8 courses. Use nominal size brick.

Max. Marks: 56

28

Set

Seat No.

		,	DOOK. 2) Lise of popprogrammable calc	ulator	is parmitted		
		4	3) Figures to the right indicate ful	l mark	is permitted.		
		2	4) Assume suitable data if necess	sary.			
			MCQ/Objective T	ype (Questions		
Dura	tion: 3	80 M	inutes		Marks: 1		
Q.1	Choo	Choose the correct alternatives from the options.					
	1)	Un	it Of kinematic viscosity is	•	2.		
		a)	N/M	b)	m²/s		
		C)	N-m/s ²	d)	kg/m ^o		
	2)	The	e typical example of non-Newton	ian flu	iid of pseudo plastic variety is		
		a)	Water	b)	Blood		
		c)	Air	d)	Printing ink		
	3)	The	e value of atmospheric pressure	is	·		
		a)	750 mm of Hg	b)	700 mm of Hg		
		C)	10.33 ml. of H ₂ O	d)	11.3 mt of H ₂ O		
	4)	Ce	ntre of pressure $(ar{h})$ in case of in	immersed surface is given by			
		a)	$\bar{h} = \frac{\text{IGsin }\theta}{A\bar{X}} + \bar{X}$	b)	$\bar{h} = \frac{\mathrm{IG}^2 \sin \theta}{\bar{x}} + \bar{X}$		
		C)	$\overline{L} = \frac{AX}{IGsin \theta} + \overline{V}$	d)	\overline{T} IGSin ² θ , \overline{T}		
		-)	$h = \frac{1}{A^2 \overline{X}} + X$		$h = - A\overline{X} + X$		
	5)	lf tł	If the position of metacenre (M) remains lower than c.g. of the body - G,				
		the	body will remain in state of	—: 、			
		a)	Stable equilibrium	b)	Neutral		
		C)	Unstable equilibrium	a)	None of the above		
	6)	The	e path followed by fluid particle ir	moti	on is called		
		a)	stream line	D)	streak line		
	_,	C)		u)			
	7)	The wit	e type of flow in which the velocit h respect to space called	y at a 	ny given time does not change		
		a)	Steady flow	b)	Uniform flow		
		c)	compressible flow	d)	rotational now		
	8)	Wł	nich of following is application of I	Berno	ulli's equation?		

b) Pitot tube

All

d)

Day & Date: Tuesday, 17-12-2019

Seat No.

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS - I

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

Time: 10:00 AM To 01:00 PM

a) Venturi meter

c) Orifice meter

SLR-FM-624

Set

Max. Marks: 70

Ρ

Marks: 14

				Set	Ρ
9)	Co a) c)	efficient of contraction (ϵ_c) is equal a_c/a a/a_c	al to b) d)	$a \times a_c$ $\sqrt{a_c/a}$	
10)	The a) c)	e total energy represented by the Nm/s Ns/m	Berno b) d)	oulli's equation has the units Nm/m Nm/N	
11)	Los a) c)	is of head due to sudden enlargement $\frac{(V_1 - V_2)3}{2g}$ $\frac{(V_1 - V_2)}{2g}$	nt is gi b) d)	iven as $\frac{(V_1-V_2)2}{2g}$ None of these	
12)	Pip a) c)	e network system solved by Bernoulli's equation Stoke's equation	 b) d)	Hardy cross equation Chery's equation	
13)	At t a) c)	the point of boundary layer separa Velocity is negative Shear stress is zero	ation <u>.</u> b) d)	 Shear stress is maximum Pressure gradient is zero	
14)	The a) b)	e drag force on a body is Net frictional force on the body Net pressure force on the body i	n dire	ection of relative velocity	

- c) The component of resultant force in the direction of relative velocity
- d) None of above

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS - I

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.2 and Q.No.6 are compulsory. And solve any two question from remaining question from each section.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of nonprogrammable calculator is permitted.

Section – I

Q.2	a) b)	State and prove hydrostatic law. Calculate the density, specific weight & weight of one litre of petrol of specific gravity 0.7.	05 04
	c)	Show graphically different types of fluids.	01
Q.3	a)	An Inverted U-tube manometer is connected to two horizontal pipes 'A' & 'B' through which water is flowing. The vertical distance between the axes of these pipes is 30 cm. When an oil of sp.gr. 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (When measured from the respective centerlines of the pipes) are found to be same & equal to 35 cm. Determine the difference of pressure between the pipes.	05
	D)	directions.	04
Q.4	a) b)	 Define: 1) Centre of pressure 2) Metacentre 3) Buoyancy 4) Metacentric height A stone weights 392.4 N in air & 196.2 N in water. Compute the volume of stone & its specific gravity. 	04 05
Q.5	a)	Define:1) compressible flow2) Rotational flow3) 3-Dimensional flow4) Uniform flow	04
	b)	A 25 cm diameter pipe carries oil of sp.gr. 0.9 at a velocity of 3m/sec. At another section the diameter is 20 cm. Find velocity at this section & also mass flow rate of oil.	05

Max. Marks: 56

Set

Ρ

03

SLR-FM-624

Set

Page 4 of 16

Section – II

- Q.6 Derive an expression for Bernoulli's theorem from first principle and state a) 06 the assumptions made for the derivation. b) A300mmx 150mm venturimeter is provided in a vertical pipeline carrying 04 oil of specific gravity 0.9, flow being Upward. The difference in elevation of the throat section and entrance section of the venturimeter is 300mm. the differential U-tube mercury manometer shows a gauge deflection of 250mm. Calculate,
 - The discharge of oil and 1)

2) The difference between the entrance section and the throat section. Take the coefficient of meter as 0.98 and specific gravity of mercury as 13.6.

- Derive Darcy-WeisBach equation and state assumptions made. Q.7 06 a)
 - Derive an expression for determination of coeff. Of velocity in orifice. d) 03
- Explain with sketch water hammer and siphon pipe. **Q.8** a)

10

D

r=1

Calculate discharge in each pipe of the network by Hardy cross method. If 06 b) $h_f = r Q^2$.

r = 3

с

r = 2

20

r = 1



b) The velocity distribution in the boundary layer is given by is

$$\frac{u}{U} = \left(\frac{y}{\delta}\right)^{1/2}$$

Calculate:

- **Displacement thickness** 1)
- 2) Momentum thickness
- 3) Energy thickness

		S.E	E. (Part – I) (Old) (CGPA) E Civil Engir FLUID MECH	xam neeri ANI(ination Nov/Dec-2019 ng CS – I
Day a Time	& Date : 10:00	e: Tu D AN	uesday,17-12-2019 / To 01:00 PM		Max. Marks: 70
Instr	uctior	າຣ: 1) Q. No. 1 is compulsory and sho	ould b	e solved in first 30 minutes in answer
			book. 2) Use of nonprogrammable calcu 3) Figures to the right indicate full 4) Assume suitable data if necess	ulator mark sary.	is permitted. <s.< td=""></s.<>
			MCQ/Objective Ty	ype (Questions
Dura	tion: 3	0 Mi	nutes		Marks: 14
Q.1	Choo	se	the correct alternatives from th	ie op	tions. 14
	1)	۷۷h ع)	Nepturi meter	Berno	Ulli's equation?
		c)	Orifice meter	d)	All
	2)	Co	efficient of contraction (ϵ_c) is equ	al to	
	,	a)	a_c/a	b)	$a \times a_c$
		c)	a_{a_c}	d)	$\sqrt{a_c/a}$
	3)	The	e total energy represented by the	Bern	oulli's equation has the units
		a)	Nm/s	b)	Nm/m
		с)	NS/M	a)	NM/N
	4)	Los	is of head due to sudden enlargeme $(V_1 - V_2)_3$	nt is g b)	$(V_1 - V_2)^2$
		u)	$\frac{1}{2g}$	0)	$\frac{1}{2g}$
		c)	$\frac{(V_1 - V_2)}{2a}$	d)	None of these
	5)	Pip	e network system solved by		
	- /	a)	Bernoulli's equation	b)	Hardy cross equation
		c)	Stoke's equation	d)	Chery's equation
	6)	At t	he point of boundary layer separ	ation	·
		a)	Velocity is negative	b)	Shear stress is maximum
	_`	C)	Shear stress is zero	a)	Pressure gradient is zero
	7)	The a)	e drag force on a body is Net frictional force on the body		
		b)	Net pressure force on the body	in dir	ection of relative velocity
		c)	The component of resultant force	e in t	he direction of relative velocity
		d)	None of above		
	8)	Uni	t Of kinematic viscosity is)	m ² /s

SLR-FM-624

a) N/M c) N-m/s² b) d) m²/s kg/m³ Set Q

750 mm of Hg 700 mm of Hg a) b) 11.3 mt of H₂O 10.33 ml. of H₂O d) C)

b)

d)

11) Centre of pressure (\bar{h}) in case of inclined immersed surface is given by _____.

- a) $\bar{h} = \frac{IGsin \theta}{A\overline{X}} + \overline{X}$ c) $\bar{h} = \frac{IGsin \theta}{A^2\overline{X}} + \overline{X}$ $\overline{h} = \frac{IG^2 \sin \theta}{A\overline{X}} + \overline{X}$ $\overline{h} = \frac{IG \sin^2 \theta}{A\overline{X}} + \overline{X}$ b) d)
- If the position of metacenre (M) remains lower than c.g. of the body G, 12) the body will remain in state of ____
 - a) Stable equilibrium b) Neutral

The value of atmospheric pressure is

c) Unstable equilibrium d) None of the above

13) The path followed by fluid particle in motion is called _

- a) stream line b) streak line
 - c) path line d) none of the above

The type of flow in which the velocity at any given time does not change 14) with respect to space called _____.

- b) Steady flow a) d)
- compressible flow c)
- Uniform flow rotational now

Page 6 of 16

SLR-FM-624

Set Q

The typical example of non-Newtonian fluid of pseudo plastic variety is

Printing ink

a) Water c) Air

9)

10)

Blood

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – I

Day & Date: Tuesday,17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.2 and Q.No.6 are compulsory. And solve any two question from remaining question from each section.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of nonprogrammable calculator is permitted.

Section – I

Q.2	a) b)	State and prove hydrostatic law. Calculate the density, specific weight & weight of one litre of petrol of specific gravity 0.7.	05 04
	c)	Show graphically different types of fluids.	01
Q.3	a) b)	An Inverted U-tube manometer is connected to two horizontal pipes 'A' & 'B' through which water is flowing. The vertical distance between the axes of these pipes is 30 cm. When an oil of sp.gr. 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (When measured from the respective centerlines of the pipes) are found to be same & equal to 35 cm. Determine the difference of pressure between the pipes. Prove that intensity of pressure at a point in a static fluid is equal in all	05 04
		directions.	
Q.4	a) b)	Define: 1) Centre of pressure 2) Metacentre 3) Buoyancy 4) Metacentric height A stone weights 392.4 N in air & 196.2 N in water. Compute the volume of stone & its specific gravity.	04 05
Q.5	a)	Define: 1) compressible flow 2) Rotational flow 3) 3-Dimensional flow 4) Uniform flow	04
	b)	A 25 cm diameter pipe carries oil of sp.gr. 0.9 at a velocity of 3m/sec. At another section the diameter is 20 cm. Find velocity at this section & also mass flow rate of oil.	05

Set Q

6

Max. Marks: 56

06

03

06

04

SLR-FM-624

Set

d) Derive an expression for determination of coeff. Of velocity in orifice. 03

Take the coefficient of meter as 0.98 and specific gravity of mercury as

Derive Darcy-WeisBach equation and state assumptions made.

Section – II

Derive an expression for Bernoulli's theorem from first principle and state

A300mmx 150mm venturimeter is provided in a vertical pipeline carrying

differential U-tube mercury manometer shows a gauge deflection of

oil of specific gravity 0.9, flow being Upward. The difference in elevation of the throat section and entrance section of the venturimeter is 300mm. the

The difference between the entrance section and the throat section.

Q.8 a) Explain with sketch water hammer and siphon pipe.

the assumptions made for the derivation.

The discharge of oil and

250mm. Calculate,

b) Calculate discharge in each pipe of the network by Hardy cross method. If $h_f = rQ^2$.



Q.9 a) Explain the concept of equivalent length and equivalent diameter of pipe.
 D) The velocity distribution in the boundary layer is given by is
 D6

$$\frac{u}{U} = \left(\frac{y}{\delta}\right)^{1/2}$$

Calculate:

Q.6

Q.7

a)

a)

b)

1) 2)

13.6.

- 1) Displacement thickness
- 2) Momentum thickness
- 3) Energy thickness

Max. Marks: 70 book. 2) Use of nonprogrammable calculator is permitted. 3) Figures to the right indicate full marks. 4) Assume suitable data if necessary. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 14 Choose the correct alternatives from the options. If the position of metacenre (M) remains lower than c.g. of the body - G. the body will remain in state of a) Stable equilibrium b) Neutral c) Unstable equilibrium d) None of the above The path followed by fluid particle in motion is called _____ a) stream line streak line b) c) path line d) none of the above The type of flow in which the velocity at any given time does not change with respect to space called ____ a) Steady flow b) Uniform flow c) compressible flow d) rotational now Which of following is application of Bernoulli's equation? a) Venturi meter Pitot tube b) c) Orifice meter All d)

Coefficient of contraction (ϵ_c) is equal to _ 5) a) $a_c/$ ~ ` ~

a)	a^{c}/a	D)	$a \times a_c$
c)	a_{a_c}	d)	$\sqrt{a_c/a}$

6) The total energy represented by the Bernoulli's equation has the units _____.

- a) Nm/s b) Nm/m c) Ns/m d) Nm/N
- Loss of head due to sudden enlargement is given as _ 7) (V V)

a)	$(v_1 - v_2)$	D)	$(v_1 - v_2)^2$
	2 <i>g</i>		2 <i>g</i>
c)	$(V_1 - V_2)$	d)	None of these
-/	2 <i>g</i>		

Pipe network system solved by ____ 8)

- a) Bernoulli's equation b) Hardy cross equation
 - Stoke's equation Chery's equation d) c)

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

FLUID MECHANICS – I

Civil Engineering

Seat

No.

Q.1

1)

2)

3)

4)

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

14

SLR-FM-624

Set

R

			SLR-FM-624	•
			Set R	
9)	At the point of boundary layer separa) Velocity is negativec) Shear stress is zero	ation b) d)	 Shear stress is maximum Pressure gradient is zero	
10)	 The drag force on a body is a) Net frictional force on the body b) Net pressure force on the body c) The component of resultant force d) None of above 	in dire ce in t	ection of relative velocity he direction of relative velocity	
11)	Unit Of kinematic viscosity is a) N/M c) N-m/s ²	 b) d)	m²/s kg/m³	
12)	The typical example of non-Newton <u>a)</u> . a) Water c) Air	ian flu b) d)	id of pseudo plastic variety is Blood Printing ink	
13)	The value of atmospheric pressure a) 750 mm of Hg c) 10.33 ml. of H ₂ O	is b) d)	 700 mm of Hg 11.3 mt of H₂O	
14)	Centre of pressure (\bar{h}) in case of ine a) $\bar{h} = \frac{IG\sin\theta}{A\bar{X}} + \bar{X}$	clined b)	immersed surface is given by $\bar{h} = \frac{IG^2 \sin \theta}{A \overline{X}} + \overline{X}$	

c)
$$\bar{h} = \frac{\overset{AX}{IGsin}\theta}{\overset{AZ}{A^2}\bar{X}} + \bar{X}$$
 d) $\bar{h} = \frac{\overset{AX}{IGSin}\theta}{\overset{AZ}{A}\bar{X}} + \bar{X}$

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS – I

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.2 and Q.No.6 are compulsory. And solve any two question from remaining question from each section.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of nonprogrammable calculator is permitted.

Section – I

Q.2	a) b)	State and prove hydrostatic law. Calculate the density, specific weight & weight of one litre of petrol of specific gravity 0.7.	05 04
	c)	Show graphically different types of fluids.	01
Q.3	a) b)	An Inverted U-tube manometer is connected to two horizontal pipes 'A' & 'B' through which water is flowing. The vertical distance between the axes of these pipes is 30 cm. When an oil of sp.gr. 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (When measured from the respective centerlines of the pipes) are found to be same & equal to 35 cm. Determine the difference of pressure between the pipes. Prove that intensity of pressure at a point in a static fluid is equal in all	05 04
	-	directions.	
Q.4	a) b)	 Define: 1) Centre of pressure 2) Metacentre 3) Buoyancy 4) Metacentric height A stone weights 392.4 N in air & 196.2 N in water. Compute the volume of stone & its specific gravity. 	04 05
Q.5	a)	Define: 1) compressible flow 2) Rotational flow 3) 3-Dimensional flow 4) Uniform flow	04
	b)	A 25 cm diameter pipe carries oil of sp.gr. 0.9 at a velocity of 3m/sec. At another section the diameter is 20 cm. Find velocity at this section & also mass flow rate of oil.	05

Max. Marks: 56

Set

R

06

06

04

SLR-FM-624

Set

Q.7 a) Derive Darcy-WeisBach equation and state assumptions made.
 06
 d) Derive an expression for determination of coeff. Of velocity in orifice.
 03

Take the coefficient of meter as 0.98 and specific gravity of mercury as

Section – II

Derive an expression for Bernoulli's theorem from first principle and state

A300mmx 150mm venturimeter is provided in a vertical pipeline carrying

differential U-tube mercury manometer shows a gauge deflection of

oil of specific gravity 0.9, flow being Upward. The difference in elevation of the throat section and entrance section of the venturimeter is 300mm. the

The difference between the entrance section and the throat section.

Q.8 a) Explain with sketch water hammer and siphon pipe.

the assumptions made for the derivation.

The discharge of oil and

250mm. Calculate,

a) Explain with sketch water hammer and siphon pipe. 03 b) Calculate discharge in each pipe of the network by Hardy cross method. If $h_f = rQ^2$.



Q.9 a) Explain the concept of equivalent length and equivalent diameter of pipe.
 D) The velocity distribution in the boundary layer is given by is
 D6

$$\frac{u}{U} = \left(\frac{y}{\delta}\right)^{1/2}$$

Calculate:

Q.6

a)

b)

1) 2)

13.6.

- 1) Displacement thickness
- 2) Momentum thickness
- 3) Energy thickness

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Use of nonprogrammable calculator is permitted. 3) Figures to the right indicate full marks. 4) Assume suitable data if necessary. MCQ/Objective Type Questions **Duration: 30 Minutes** Q.1 Choose the correct alternatives from the options. The total energy represented by the Bernoulli's equation has the units _____. 1) Nm/s b) Nm/m a) Ns/m d) Nm/N c) Loss of head due to sudden enlargement is given as _ 2) $(V_1 - V_2)3$ $(V_1 - V_2)^2$ a) b) 2*g* 2*g* $(V_1 - V_2)$ d) None of these C) 3) Pipe network system solved by ____ ___. Bernoulli's equation a) b) Hardy cross equation c) Stoke's equation Chery's equation d) 4) At the point of boundary layer separation _ a) Velocity is negative b) Shear stress is maximum c) Shear stress is zero d) Pressure gradient is zero 5) The drag force on a body is ____

- a) Net frictional force on the body
- b) Net pressure force on the body in direction of relative velocity
- c) The component of resultant force in the direction of relative velocity
- d) None of above
- 6) Unit Of kinematic viscosity is _____
 - b) m^2/s a) N/M c) N-m/s² d) kg/m³
- 7) The typical example of non-Newtonian fluid of pseudo plastic variety is
 - Water b) Blood a) c) Air d) Printing ink
- 8) The value of atmospheric pressure is _____
 - a) 750 mm of Hg 700 mm of Hg b) c) 10.33 ml. of H₂O d) 11.3 mt of H₂O

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS – I

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

Marks: 14

14

SLR-FM-624

Set



Set S

- 9) Centre of pressure (\bar{h}) in case of inclined immersed surface is given by _____.
 - a) $\bar{h} = \frac{IG\sin\theta}{A\bar{X}} + \bar{X}$ c)

$$b) \quad \bar{h} = \frac{13 \sin^2 \theta}{A^2 \bar{X}} + \bar{X}$$

- b) $\bar{h} = \frac{IG^2 \sin \theta}{A\overline{X}} + \overline{X}$ d) $\bar{h} = \frac{IG \sin^2 \theta}{A\overline{X}} + \overline{X}$
- 10) If the position of metacenre (M) remains lower than c.g. of the body - G, the body will remain in state of _____
 - b) a) Stable equilibrium Neutral
 - c) Unstable equilibrium d) None of the above
- The path followed by fluid particle in motion is called _____ 11)
 - a) stream line b) streak line
 - c) path line d) none of the above
- The type of flow in which the velocity at any given time does not change 12) with respect to space called _
 - Uniform flow b) a) Steady flow
 - c) compressible flow rotational now d)
- 13) Which of following is application of Bernoulli's equation?
 - a) Venturi meter Pitot tube b)
 - c) Orifice meter d) All
- Coefficient of contraction (ϵ_c) is equal to _ 14)
 - a_c/a a) b) $a \times a_c$ d) $\sqrt{\frac{a_c}{a}}$ c)
 - a_{a_c}

Seat	
No.	
NO.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS - I

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.2 and Q.No.6 are compulsory. And solve any two question from remaining question from each section.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of nonprogrammable calculator is permitted.

Section – I

Q.2	a) b)	State and prove hydrostatic law. Calculate the density, specific weight & weight of one litre of petrol of specific gravity 0.7.	05 04
	C)	Show graphically different types of fluids.	01
Q.3	a)	An Inverted U-tube manometer is connected to two horizontal pipes 'A' & 'B' through which water is flowing. The vertical distance between the axes of these pipes is 30 cm. When an oil of sp.gr. 0.8 is used as a gauge fluid, the vertical heights of water columns in the two limbs of the inverted manometer (When measured from the respective centerlines of the pipes) are found to be same & equal to 35 cm. Determine the difference of pressure between the pipes.	05
	D)	directions.	04
Q.4	a) b)	Define: 1) Centre of pressure 2) Metacentre 3) Buoyancy 4) Metacentric height A stone weights 392.4 N in air & 196.2 N in water. Compute the volume of stone & its specific gravity.	04 05
Q.5	a)	Define:1)compressible flow2)Rotational flow3)3-Dimensional flow4)Uniform flow	04
	b)	A 25 cm diameter pipe carries oil of sp.gr. 0.9 at a velocity of 3m/sec. At another section the diameter is 20 cm. Find velocity at this section & also mass flow rate of oil.	05

Max. Marks: 56

Set

S

03

SLR-FM-624

Set

Section – II

- Q.6 a) Derive an expression for Bernoulli's theorem from first principle and state the assumptions made for the derivation.
 b) A300mmx 150mm venturimeter is provided in a vertical pipeline carrying oil of specific gravity 0.9, flow being Upward. The difference in elevation of the throat section and entrance section of the venturimeter is 300mm. the differential U-tube mercury manometer shows a gauge deflection of 250mm. Calculate,
 - 1) The discharge of oil and

The difference between the entrance section and the throat section.
 Take the coefficient of meter as 0.98 and specific gravity of mercury as 13.6.

- **Q.7 a)** Derive Darcy-WeisBach equation and state assumptions made. **06**
 - d) Derive an expression for determination of coeff. Of velocity in orifice. 03
- **Q.8** a) Explain with sketch water hammer and siphon pipe.
 - b) Calculate discharge in each pipe of the network by Hardy cross method. If $h_f = rQ^2$.



Q.9 a) Explain the concept of equivalent length and equivalent diameter of pipe.
 D) The velocity distribution in the boundary layer is given by is
 D6

$$\frac{u}{U} = \left(\frac{y}{\delta}\right)^{1/2}$$

Calculate:

1) Displacement thickness

- 2) Momentum thickness
- 3) Energy thickness
| | Ċ | b) Draw near diagrams wherever | lece | ssary. | |
|------------|---|---|---------------------------------|---|---|
| | | MCQ/Objective Ty | pe | Questions | |
| on: 3 | 0 Mi | inutes | - | Marks: 1 | 4 |
| Choc
1) | D se f
Me
call
a)
c) | the correct alternatives from th
tamorphic rock with alternating la
led as a
schist
slate | e op
yers
b)
d) | of light and dark minerals is | 4 |
| 2) | The
a)
c) | e crust of the earth is separated fr
Gutenberg
Lehmann | rom r
b)
d) | mantle by discontinuity.
Mohorovicic
Conrad | |
| 3) | Wh
a)
c) | iich one of the following is not a p
Crater
Delta | art o
b)
d) | f volcano?
Conduit
Dyke | |
| 4) | A c
call
a)
c) | oarse grained sedimentary rock v
led as
breccia
conglomerate | vith r
b)
d) | ounded pebbles, cobbles is
sandstone
basalt | |
| 5) | In _
a)
c) | fold, axial plane is horizont
anticline
overturned | al.
b)
d) | asymmetrical
recumbent | |
| 6) | Hai
a)
c) | rdness of Corundum is
1
8 | b)
d) | 10
9 | |
| 7) | The
with
a)
c) | e breaking of the rocks into smalle
nout change in their composition i
chemical
biological | er fra
is ca
b)
d) | igments by natural agents
lled weathering.
mechanical
hydrolysis | |
| 8) | Slo
a)
c) | ping surface of the valley upon w
toe
abutment | hich
b)
d) | dam rests is known as
heel
pier | |
| 9) | Th∉
a)
c) | e primary force driving landslides
solar
geothermal | is
b)
d) |
gravitational
tidal | |

Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 2) Drow poot diagrams wherever pooperry

Duratio

Seat

No.

Q.1

Page **1** of **12**

SLR-FM-625



S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Max. Marks: 70

Ρ

SLR-FM-625

Set

a) Seismoscope c) Seismograph

table is _____ type.

a) effluent

c) confluent

10)

11)

- Which of the following instrument records earthquake waves?

b) Seismogram Seismometer d)

influent

d) all of these

The capacity of the rocks to withstand bending loads is called as _____. 12)

The leakage of the water from the reservoir takes place when the water

b)

- a) compressive strength b) tensile strength
- c) durability

- d) bulk density
- 13) The most efficient, cheaper and rapid method used for determination of sub-surface geology is _____.
 - a) seismic method
- b) gravity method
- c) magnetic method
- d) electric resistivity method
- 14) Which of the following dam can be constructed on weak, unconsolidated foundation?
 - a) Earthen dam
 - c) Gravity dam

- b) Arch dam
- d) None of these

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday,19-12-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Instructions: 1) Q.5 and Q.9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

a) b)	Define Fault. Describe elements of fault. Describe strike and dip joints.	05 04
a)	Define Sedimentary rocks. Describe any two structures of Sedimentary rocks.	05
b)	Describe physical properties and chemical properties of silica group minerals.	04
a) b)	Define Volcano. Describe Pyroclastic materials Describe physical features- Waterfall and Pot holes.	05 04
An: a) b) c) d) e) f)	swer the following. (Any Five) Explain Granitic texture What is Non-conformity? Describe Fold mountain. Distinguish between acidic and basic igneous rocks. Give any two sub-divisions of Geology. Describe any two types of luster with examples.	10
	Section – II	
a) b)	Define Aquifer. Describe Confined aquifer. Define Landslides. Explain any two causes of Landslides.	05 04
a) b)	Describe Primary and Secondary Seismic waves. Explain Calyx and Diamond drilling methods.	05 04
a)	Define Dam. Describe desirable and undesirable conditions for construction of dams on folds.	05
b)	Explain tunneling through inclined beds.	04
An: a) b) c) d) e) f)	swer the following. (Any Five) What is Rain water harvesting? Explain Arch dam. Write note on – RQD. Explain Silting process. What is Crushing Strength of rocks? Write note on – RIS.	10
	a) b) a) b) A) b) c) d) e) f) a) b) a) b) A) b) c) d) e) f) a) b) A) b) c) d) e) f) a) b) a) b) c) d) e) f) b) a) b) c) c) c) c) c) c) c) c) c) c) c) c) c)	 a) Define Fault. Describe elements of fault. b) Describe strike and dip joints. a) Define Sedimentary rocks. Describe any two structures of Sedimentary rocks. b) Describe physical properties and chemical properties of silica group minerals. a) Define Volcano. Describe Pyroclastic materials b) Describe physical features- Waterfall and Pot holes. Answer the following. (Any Five) a) Explain Granitic texture b) What is Non-conformity? c) Describe Fold mountain. d) Distinguish between acidic and basic igneous rocks. e) Give any two sub-divisions of Geology. f) Describe any two types of luster with examples. Section – II a) Define Aquifer. Describe Confined aquifer. b) Define Landslides. Explain any two causes of Landslides. a) Describe Primary and Secondary Seismic waves. b) Explain Calyx and Diamond drilling methods. a) Define Dam. Describe desirable and undesirable conditions for construction of dams on folds. b) Explain Arch dam. c) Write note on - RQD. d) Explain Silting process. e) Write note on - RIS.

Set

Ρ

NU.							
		S.E	E. (Part – I)	(Old) (CGF Civil I	PA) Exan Enginee	nination Nov/Deo ring	c-2019
				ENGINEE	RING GE	EOĽOGY	
Day Time	& Date : 10:0	e: Th 0 AN	nursday,19-1 /I To 01:00 P	2-2019 M			Max. Marks: 70
Instr	uctior	1s: 1	l) Q. No. 1 is Book.	compulsory a	nd should	be solved in first 30	minutes in answer
			 Figures to Draw neat 	the right indica diagrams whe	ate full ma erever nec	rks. essary.	
			Ν	ICQ/Objecti	ve Type	Questions	
Dura	tion: 3	0 M	inutes				Marks: 14
Q.1	Choo	ose	the correct a	alternatives fr	om the o	ptions.	14
	1)	Slo	ping surface	of the valley u	ipon which	n dam rests is known) as
		а) С)	abutment		d)	pier	
	2)	The	e primary for	ce driving land	slides is	· .	
	,	a)	solar	3	b)	gravitational	
		c)	geothermal		d)	tidal	
	3)	The tab	e leakage of le is t	the water from ype.	the reser	voir takes place whe	n the water
		a) c)	effluent confluent		b) d)	influent all of these	
	4)	Wh	nich of the fol	lowing instrum	ent record	ls earthquake waves	?
		a)	Seismosco	pe	b)	Seismogram	
	C)	С) Ть	Seismoyra		U) ith a ta a d b		4
	5)	a)	compressiv	e strength	iinsiand b b)	tensile strength	u as
		c)	durability	e en en gan	d)	bulk density	
	6)	The	e most efficie	ent, cheaper ar	nd rapid m	ethod used for deter	mination of
		sub	o-surface geo	ology is		arovity mothod	
		a) c)	magnetic me	nethod	(a (b	electric resistivity r	nethod
	7)	Wh	nich of the fol	lowing dam ca	n be cons	tructed on weak. un	consolidated
	- /	fou	ndation?				
		a)	Earthen da	m	b)	Arch dam	
	•	C)	Gravity dan	n 	a)	None of these	
	8)	Me	tamorphic ro led as a	ck with alterna	iting layers	s of light and dark mi	inerals is
		a)	schist	·	b)	gneiss	
		c)	slate		d)	phyllite	
	9)	The	e crust of the Gutenberg	earth is separ	ated from	mantle by dis	scontinuity.
		c)	Lehmann		d)	Conrad	

Set Q

SLR-FM-625 Set Q

- 10) Which one of the following is not a part of volcano?
 - a) Crater b) Conduit
 - c) Delta d) Dyke
- 11) A coarse grained sedimentary rock with rounded pebbles, cobbles is called as _____.
 - a) breccia

- b) sandstone
- c) conglomerate d
- d) basalt
- 12) In _____ fold, axial plane is horizontal.
 - a) anticline b) asymmetrical
 - c) overturned d) recumbent
- 13) Hardness of Corundum is _____.
 - a) 1 b) 10
 - c) 8 d) 9

14) The breaking of the rocks into smaller fragments by natural agents without change in their composition is called _____ weathering.

a) chemicalc) biological

- b) mechanicald) hydrolysis
- d)

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday,19-12-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Instructions: 1) Q.5 and Q.9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

Q.2	a) b)	Define Fault. Describe elements of fault. Describe strike and dip joints.	05 04
Q.3	a)	Define Sedimentary rocks. Describe any two structures of Sedimentary	05
	b)	Describe physical properties and chemical properties of silica group minerals.	04
Q.4	a) b)	Define Volcano. Describe Pyroclastic materials Describe physical features- Waterfall and Pot holes.	05 04
Q.5	An: a) b) c) d) e) f)	swer the following. (Any Five) Explain Granitic texture What is Non-conformity? Describe Fold mountain. Distinguish between acidic and basic igneous rocks. Give any two sub-divisions of Geology. Describe any two types of luster with examples.	10
		Section – II	
Q.6	a) b)	Define Aquifer. Describe Confined aquifer. Define Landslides. Explain any two causes of Landslides.	05 04
Q.7	a) b)	Describe Primary and Secondary Seismic waves. Explain Calyx and Diamond drilling methods.	05 04
Q.8	a)	Define Dam. Describe desirable and undesirable conditions for construction of dams on folds.	05
	b)	Explain tunneling through inclined beds.	04
Q.9	An: a) b) c) d) e) f)	swer the following. (Any Five) What is Rain water harvesting? Explain Arch dam. Write note on – RQD. Explain Silting process. What is Crushing Strength of rocks? Write note on – RIS.	10



		S.E. (Part – I) (Old) (CGPA) Civil En) Exam gineer	ination Nov/Dec-2019 ing
		ENGINEERI	NG GE	OLOGY
Day Time	& Dat e: 10:0	e: Thursday,19-12-2019 0 AM To 01:00 PM		Max. Marks: 70
Instr	ructio	ns: 1) Q. No. 1 is compulsory and Book.2) Figures to the right indicate	should full mar	be solved in first 30 minutes in answer ks.
		Draw neat diagrams where	er nece	essary.
D	tion	MCQ/Objective	Туре	Questions Markey 44
Dura		30 minutes		Marks: 14
Q.1	Cho 1)	ose the correct alternatives from In fold axial plane is horiz	n the op ontal	otions. 14
	',	a) anticline c) overturned	b) d)	asymmetrical recumbent
	2)	Hardness of Corundum is a) 1 c) 8	b) d)	10 9
	3)	The breaking of the rocks into sm without change in their compositi a) chemical c) biological	naller fra on is ca b) d)	agments by natural agents Iled weathering. mechanical hydrolysis
	4)	Sloping surface of the valley upor a) toe c) abutment	n which b) d)	dam rests is known as heel pier
	5)	The primary force driving landslic a) solar c) geothermal	les is b) d)	 gravitational tidal
	6)	The leakage of the water from the table is type. a) effluent c) confluent	e reserv b) d)	oir takes place when the water influent all of these
	7)	Which of the following instrument a) Seismoscope c) Seismograph	t record b) d)	s earthquake waves? Seismogram Seismometer
	8)	The capacity of the rocks to withs a) compressive strength c) durability	stand be b) d)	ending loads is called as tensile strength bulk density
	9)	The most efficient, cheaper and r sub-surface geology is a) seismic method c) magnetic method	apid me b) d)	ethod used for determination of gravity method electric resistivity method

Set

R

Seat

No.

N //

- Which of the following dam can be constructed on weak, unconsolidated 10) foundation? Arch dam b)
 - a) Earthen dam
 - c) Gravity dam d) None of these
- 11) Metamorphic rock with alternating layers of light and dark minerals is called as a _____.
 - a) schist b) gneiss
 - phyllite c) slate d)
- The crust of the earth is separated from mantle by _____ discontinuity. 12) a) Gutenberg
 - b) Mohorovicic
 - c) Lehmann d) Conrad
- Which one of the following is not a part of volcano? 13)
 - b) a) Crater Conduit
 - Delta d) Dyke c)
- A coarse grained sedimentary rock with rounded pebbles, cobbles is 14) called as _ _.
 - a) breccia
 - c) conglomerate

- b) sandstone
- d) basalt

Set

SLR-FM-625

R

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.5 and Q.9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

Q.2	a) b)	Define Fault. Describe elements of fault. Describe strike and dip joints.	05 04
Q.3	a)	Define Sedimentary rocks. Describe any two structures of Sedimentary	05
	b)	Describe physical properties and chemical properties of silica group minerals.	04
Q.4	a) b)	Define Volcano. Describe Pyroclastic materials Describe physical features- Waterfall and Pot holes.	05 04
Q.5	Ans a) b) c) d) e) f)	swer the following. (Any Five) Explain Granitic texture What is Non-conformity? Describe Fold mountain. Distinguish between acidic and basic igneous rocks. Give any two sub-divisions of Geology. Describe any two types of luster with examples.	10
		Section – II	
Q.6	a) b)	Define Aquifer. Describe Confined aquifer. Define Landslides. Explain any two causes of Landslides.	05 04
Q.7	a) b)	Describe Primary and Secondary Seismic waves. Explain Calyx and Diamond drilling methods.	05 04
Q.8	a)	Define Dam. Describe desirable and undesirable conditions for construction of dams on folds.	05
	b)	Explain tunneling through inclined beds.	04
Q.9	An: a) b) c) d) e) f)	Swer the following. (Any Five) What is Rain water harvesting? Explain Arch dam. Write note on – RQD. Explain Silting process. What is Crushing Strength of rocks? Write note on – RIS.	10

Max. Marks: 56

R

Set

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** ENGINEERING GEOLOGY

Day & Date: Thursday, 19-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- The leakage of the water from the reservoir takes place when the water 1) table is _____ type. influent
 - a) effluent b)
 - c) confluent d) all of these
- 2) Which of the following instrument records earthquake waves?
 - a) Seismoscope b) Seismogram c) Seismograph d)
 - Seismometer
- 3) The capacity of the rocks to withstand bending loads is called as _____. b) tensile strength
 - a) compressive strength c) durability
- d) bulk density
- 4) The most efficient, cheaper and rapid method used for determination of sub-surface geology is _____.
 - a) seismic method
- b) gravity method
- c) magnetic method d) electric resistivity method
- Which of the following dam can be constructed on weak, unconsolidated 5) foundation?
 - a) Earthen dam b) Arch dam
 - d) None of these c) Gravity dam
- Metamorphic rock with alternating layers of light and dark minerals is 6) called as a _____.
 - a) schist
 - b) gneiss c) slate d) phyllite
- 7) The crust of the earth is separated from mantle by _____ discontinuity.
 - a) Gutenberg Mohorovicic b) c) Lehmann d) Conrad
- Which one of the following is not a part of volcano? 8)
 - a) Crater Conduit b)
 - c) d) Dvke Delta
- 9) A coarse grained sedimentary rock with rounded pebbles, cobbles is called as .
 - a) breccia
 - c) conglomerate
- sandstone b)
- d) basalt

Marks: 14

14

SLR-FM-625

Set

Max. Marks: 70

10) In _____ fold, axial plane is horizontal. a) anticline asymmetrical b) c) overturned d) recumbent Hardness of Corundum is _____. 11) b) 10 a) 1 c) 8 d) 9 The breaking of the rocks into smaller fragments by natural agents 12) without change in their composition is called _____ weathering. mechanical a) chemical b) c) biological d) hydrolysis Sloping surface of the valley upon which dam rests is known as _____. 13) a) toe heel b)

c) abutment d) pier

14) The primary force driving landslides is _____.

- a) solar
- c) geothermal

b) gravitational

SLR-FM-625

Set S

d) tidal

SLR-FM-6	525
Set	S

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING GEOLOGY

Day & Date: Thursday,19-12-2019 Time: 10:00 AM To 01:00 PM Max. Marks: 56

Instructions: 1) Q.5 and Q.9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

Q.2	a) b)	Define Fault. Describe elements of fault. Describe strike and dip joints.	05 04
Q.3	a)	Define Sedimentary rocks. Describe any two structures of Sedimentary rocks.	05
	b)	Describe physical properties and chemical properties of silica group minerals.	04
Q.4	a) b)	Define Volcano. Describe Pyroclastic materials Describe physical features- Waterfall and Pot holes.	05 04
Q.5	An: a) b) c) d) e) f)	swer the following. (Any Five) Explain Granitic texture What is Non-conformity? Describe Fold mountain. Distinguish between acidic and basic igneous rocks. Give any two sub-divisions of Geology. Describe any two types of luster with examples.	10
		Section – II	
Q.6	a) b)	Define Aquifer. Describe Confined aquifer. Define Landslides. Explain any two causes of Landslides.	05 04
Q.7	a) b)	Describe Primary and Secondary Seismic waves. Explain Calyx and Diamond drilling methods.	05 04
Q.8	a)	Define Dam. Describe desirable and undesirable conditions for construction of dams on folds.	05
	D)	Explain tunneling through inclined beds.	04
Q.9	An: a) b) c) d) e) f)	swer the following. (Any Five) What is Rain water harvesting? Explain Arch dam. Write note on – RQD. Explain Silting process. What is Crushing Strength of rocks? Write note on – RIS.	10

110.	SE (Dort II	
No		
Seat		

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering STRUCTURAL MECHANICS - II

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q.1 must be solved within first half an hour on the main answer sheet page No.3.
 - 2) Use of non-programmable scientific calculator is allowed.
 - 3) Use suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose correct alternative from the option and rewrite the sentence.

- A column carries central vertical load Q. The stresses on the section of the column will be _____.
 - a) Zero at one end and maximum at the other end
 - b) Uniform
 - c) Zero at the axis and maximum at the outer end
 - d) Tensile on one end and compressive at the other end
- 2) The normal stress on an oblique plane is maximum, when θ is equal to

	-		
a)	00	b)	30 ⁰
C)	45 ⁰	d)	90 ⁰

- 3) Saint Venant theory is also known as, _____.
 - a) Maximum Shear stress theory
 - b) Maximum Strain energy theory
 - c) Maximum Principal strain theory
 - d) Maximum Principal stress theory
- 4) A circular shaft of diameter D, subjected to combined twisting moment (T) and bending moment (M) carries the maximum shear stress equal to,

a)	$R\sqrt{M^2 + T^2}/I$	b)	$R(M^2 + T^2)/J$
c)	$I\sqrt{M^2+T^2}/R$	d)	$J(M^2 + T^2)/R$

5) The normal stress on an oblique plane is minimum, when θ is equal to

a)	0 ⁰	b)	45 ⁰
c)	30 ⁰	d)	90 ⁰

6) The Euler's empirical formula is useful for, ____

a) Long columnsb) Both a) and b)c) Short columnsd) None

- c) Short columns d) None
- A loaded column is having tendency to deflect on account of this tendency, the critical load, _____.
 - a) Decreases with decrease is length
 - b) First decreases then increases with decrease in length
 - c) Decreases with increase in length
 - d) First increases then decreases with decrease in length

Max. Marks: 70

Set

Marks: 14

				Set	Ρ
8)	The a) c)	e expression <i>EI</i> (d^2y/dx^2) gives Slope Shear force	s the ' b) d)	value of Bending moment Rate of loading	
9)	Fre a) c)	e end in actual beam is Free Simply supported	in co b) d)	njugate beam. Fixed Roller	
10)	Slo	pe at free end of a cantilever be	eam c	arrying point load W at free end is	
	a) c)	(wl/EI) (wl ² /2EI)	b) d)	(wl ² /EI) (wl ³ /EI)	
11)	Def ove a) c)	ection at center of a simply sup r entire span is $(5wl^4/374EI)$ $(5wl^4/384EI)$	porte b) d)	d beam carrying UDL of <i>w kN/m</i> (5 <i>wl</i> ⁴ / 308 <i>EI</i>) (5 <i>wl</i> ⁴ / 388 <i>EI</i>)	
12)	Influ a) b) c) d)	uence line diagrams are useful i Beams in residential structure Beams in water tanks Beams in bridges None	in ana	alysis of	
13)	Mul	ller Breslau's principle is plotted	for v	ariation of over entire span	
	a) c)	Point load UVL	b) d)	UDL None of the above	

- 14) While converting a beam into its conjugate beam, end supports remain same. This statement is _____.
 - a) Always truec) Can't say

b)

Always false Depends upon type of load d)

SLR-FM-626

02

SLR-FM-626

Seat No.

Q.7

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - II**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from remaining in Section I.
- 3) Solve any two questions from remaining in Section II.
- 4) Assume suitable data if required and mention it clearly.

Section – I

- Q.2 Enlist different end conditions of columns and state their effective lengths. a) 03 Draw neat sketches of effective lengths.
 - A 1.5 m long column has a circular cross section of 50 mm diameter. One 07 b) of the ends of the column is fixed in direction and position and the other is free. Taking factor of safety as 3, calculate the safe load using:
 - Rankine's formula with $f_c = 560 \text{ N/mm}^2$ and $a = \frac{1}{1600}$ for pinned ends Euler's formula with E for C. I. = 1.2 x 10⁵ N/mm² 1)
 - 2)
- 02 Q.3 Explain 'Principal planes and principal stresses'. a) At a point in a strained material, the principal stresses are 100 N/mm² and 07 b) 40 N/mm² both tensile. Find the normal, tangential and resultant stresses across a plane through the point at 48° to the major principal plane. Use Mohr's circle method.
- Q.4 a) Explain term 'Equivalent Torque'.
 - A solid shaft of diameter 80 mm is subjected to a twisting moment of 8 MN-07 b) mm and a bending moment of 5 MN-mm at a point. Determine
 - Principal stresses 1)
 - 2) Position of the plane on which they act

State and explain maximum shear stress theory. 02 Q.5 a)

A bolt is subjected to an axial pull of 9 kN, accompanied with transverse 07 b) shear force of 4.5 kN. Elastic limit in tension is 225 N/mm², factor of safety =3 and Poisson's ratio =0.3. Find diameter of the bolt using maximum shear stress theory.

Section – II

- Explain Double Integration Method for finding deflection with example of Q.6 a) 03 simply supported beam.
 - A simply supported beam is having a span of 5m and subjected to a point 07 b) load 20kN at centre of the beam. Using Moment Area Method determine deflection at centre of the beam if E is 2×10^5 N/mm² and MI as 3×10^5 mm⁴.
 - Write note on- Influence line Diagram 02 a) A simply supported beam is having a span of 3m and subjected to a 07 b) moving UDL of 18kN/m over span to 1m. Draw ILD for R_A , R_B , V_X and M_x at a section 2m from left support.

Max. Marks: 56

Set





09

Q.8 A simply supported beam is having a span of 5m and subjected to a point load 50kN at centre of the beam. Using conjugate beam method determines deflection at centre of the beam if E is $2x10^5$ N/mm² and MI as $8x10^4$ mm⁴.



- a) Point load W at free end
- **b)** UDL over entire span
- c) Couple M at free end

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

STRUCTURAL MECHANICS - II

Instructions: 1) Q.1 must be solved within first half an hour on the main answer sheet page

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

- No.3. 2) Use of non-programmable scientific calculator is allowed. 3) Use suitable data if necessary and mention it clearly. **MCQ/Objective Type Questions Duration: 30 Minutes** Marks: 14 Choose correct alternative from the option and rewrite the sentence. 14 The expression *EI* (d^2y/dx^2) gives the value of _____. 1) Bending moment Slope a) b) Shear force d) Rate of loading C) Free end in actual beam is _____ in conjugate beam. 2) Free b) Fixed a) Simply supported Roller C) d) 3) Slope at free end of a cantilever beam carrying point load W at free end is (wl^2/EI) (wl/EI)b) a) (wl^3/EI) $(wl^2/2EI)$ d) c) 4) Defection at center of a simply supported beam carrying UDL of w kN/mover entire span is _____. a) $(5wl^4/374EI)$ $(5wl^4 / 308EI)$ b) $(5wl^4 / 388EI)$ c) $(5wl^4 / 384EI)$ d) 5) Influence line diagrams are useful in analysis of _____. a) Beams in residential structure b) Beams in water tanks c) Beams in bridges d) None Muller Breslau's principle is plotted for variation of _____ over entire span 6) of beam. a) Point load b) UDL None of the above c) UVL d) 7) While converting a beam into its conjugate beam, end supports remain same. This statement is . a) Always true Always false b) c) Can't say d) Depends upon type of load A column carries central vertical load Q. The stresses on the section of 8) the column will be a) Zero at one end and maximum at the other end b) Uniform Zero at the axis and maximum at the outer end C)
 - d) Tensile on one end and compressive at the other end

Q.1

SLR-FM-626

Max. Marks: 70



9) The normal stress on an oblique plane is maximum, when θ is equal to

	<u> </u>		•
a)	0^{0}	b)	30°
c)	45 ⁰	d)	90 ⁰

- 10) Saint Venant theory is also known as, _____.
 - a) Maximum Shear stress theory
 - b) Maximum Strain energy theory
 - c) Maximum Principal strain theory
 - d) Maximum Principal stress theory
- 11) A circular shaft of diameter D, subjected to combined twisting moment (T) and bending moment (M) carries the maximum shear stress equal to,

a)
$$R\sqrt{M^2 + T^2}/J$$
b) $R(M^2 + T^2)/J$ c) $J\sqrt{M^2 + T^2}/R$ d) $J(M^2 + T^2)/R$

12) The normal stress on an oblique plane is minimum, when θ is equal to

- 13) The Euler's empirical formula is useful for, _
 - a) Long columns b) Both a) and b)
 - c) Short columns d) None
- 14) A loaded column is having tendency to deflect on account of this tendency, the critical load, _____.
 - a) Decreases with decrease is length
 - b) First decreases then increases with decrease in length
 - c) Decreases with increase in length
 - d) First increases then decreases with decrease in length

SLR-FM-626

Set

Set

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-201	9
Civil Engineering	
STRUCTURAL MECHANICS - II	

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from remaining in Section I.
- 3) Solve any two questions from remaining in Section II.
- 4) Assume suitable data if required and mention it clearly.

Section – I

- Enlist different end conditions of columns and state their effective lengths. Q.2 a) 03 Draw neat sketches of effective lengths.
 - A 1.5 m long column has a circular cross section of 50 mm diameter. One 07 b) of the ends of the column is fixed in direction and position and the other is free. Taking factor of safety as 3, calculate the safe load using:
 - Rankine's formula with $f_c = 560 \text{ N/mm}^2$ and $a = \frac{1}{1600}$ for pinned ends Euler's formula with E for C. I. = 1.2 x 10⁵ N/mm² 1)
 - 2)
- 02 Q.3 Explain 'Principal planes and principal stresses'. a) At a point in a strained material, the principal stresses are 100 N/mm² and 07 b) 40 N/mm² both tensile. Find the normal, tangential and resultant stresses across a plane through the point at 48° to the major principal plane. Use Mohr's circle method.
- Q.4 a) Explain term 'Equivalent Torque'.
 - A solid shaft of diameter 80 mm is subjected to a twisting moment of 8 MN-07 b) mm and a bending moment of 5 MN-mm at a point. Determine
 - Principal stresses 1)

Q.7

2) Position of the plane on which they act

02 Q.5 State and explain maximum shear stress theory. a)

A bolt is subjected to an axial pull of 9 kN, accompanied with transverse 07 b) shear force of 4.5 kN. Elastic limit in tension is 225 N/mm², factor of safety =3 and Poisson's ratio =0.3. Find diameter of the bolt using maximum shear stress theory.

Section – II

- Explain Double Integration Method for finding deflection with example of Q.6 a) 03 simply supported beam.
 - A simply supported beam is having a span of 5m and subjected to a point 07 b) load 20kN at centre of the beam. Using Moment Area Method determine deflection at centre of the beam if E is 2×10^5 N/mm² and MI as 3×10^5 mm⁴.
 - Write note on- Influence line Diagram 02 a) A simply supported beam is having a span of 3m and subjected to a 07 b) moving UDL of 18kN/m over span to 1m. Draw ILD for R_A, R_B, V_x and M_x at a section 2m from left support.

Max. Marks: 56

SLR-FM-626

Seat No.





09

Q.8 A simply supported beam is having a span of 5m and subjected to a point load 50kN at centre of the beam. Using conjugate beam method determines deflection at centre of the beam if E is $2x10^5$ N/mm² and MI as $8x10^4$ mm⁴.

Q.9	Determine the deflection for Cantilever beam at free end for following load	09	
	cases by moment area method.		

- a) Point load W at free end
- **b)** UDL over entire span
- c) Couple M at free end

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

STRUCTURAL MECHANICS - II

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q.1 must be solved within first half an hour on the main answer sheet page No.3.
 - 2) Use of non-programmable scientific calculator is allowed.
 - 3) Use suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose correct alternative from the option and rewrite the sentence.

1) The normal stress on an oblique plane is minimum, when θ is equal to

a)	00	b)	45 ⁰
c)	30 ⁰	d)	90 ⁰

- 2) The Euler's empirical formula is useful for, _
 - a) Long columns b) Both a) and b)
 - c) Short columns d) None
- 3) A loaded column is having tendency to deflect on account of this tendency, the critical load, _____.
 - a) Decreases with decrease is length
 - b) First decreases then increases with decrease in length
 - c) Decreases with increase in length
 - d) First increases then decreases with decrease in length
- 4) The expression $EI(d^2y/dx^2)$ gives the value of _____.
 - a) Slope b) Bending moment
 - c) Shear force d) Rate of loading
- 5) Free end in actual beam is _____ in conjugate beam.
 - a) Freeb) Fixedc) Simply supportedd) Roller
- 6) Slope at free end of a cantilever beam carrying point load W at free end is

a)	(wl/EI)	b)	(wl^2/EI)
c)	$(wl^2/2EI)$	d)	(wl^3/EI)

- 7) Defection at center of a simply supported beam carrying UDL of w kN/m over entire span is _____.
 - a) $(5wl^4/374EI)$ b) $(5wl^4/308EI)$ c) $(5wl^4/308EI)$
 - c) $(5wl^4 / 384EI)$ d) $(5wl^4 / 388EI)$
- 8) Influence line diagrams are useful in analysis of _____.
 - a) Beams in residential structure
 - b) Beams in water tanks
 - c) Beams in bridges
 - d) None

SLR-FM-626



Max. Marks: 70

Marks: 14

Set

- 9) Muller Breslau's principle is plotted for variation of _____ over entire span of beam.
 - a) Point load b) UDL
 - c) UVL d) None of the above
- 10) While converting a beam into its conjugate beam, end supports remain same. This statement is _____.
 - a) Always true b) Always false
 - c) Can't say d) Depends upon type of load
- 11) A column carries central vertical load Q. The stresses on the section of the column will be _____.
 - a) Zero at one end and maximum at the other end
 - b) Uniform
 - c) Zero at the axis and maximum at the outer end
 - d) Tensile on one end and compressive at the other end
- 12) The normal stress on an oblique plane is maximum, when θ is equal to

a)	00	b)	30 ⁰
c)	45 ⁰	d)	90 ⁰

- 13) Saint Venant theory is also known as, _____.
 - a) Maximum Shear stress theory
 - b) Maximum Strain energy theory
 - c) Maximum Principal strain theory
 - d) Maximum Principal stress theory
- 14) A circular shaft of diameter D, subjected to combined twisting moment (T) and bending moment (M) carries the maximum shear stress equal to,

a)	$R\sqrt{M^2 + T^2}/I$	b)	$R(M^2 + T^2)/J$
c)	$J\sqrt{M^2+T^2}/R$	d)	$J(M^2+T^2)/R$

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - II**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from remaining in Section I.
- 3) Solve any two questions from remaining in Section II.
- 4) Assume suitable data if required and mention it clearly.

Section – I

- Enlist different end conditions of columns and state their effective lengths. Q.2 a) 03 Draw neat sketches of effective lengths. A 1.5 m long column has a circular cross section of 50 mm diameter. One 07
 - b) of the ends of the column is fixed in direction and position and the other is free. Taking factor of safety as 3, calculate the safe load using:
 - Rankine's formula with $f_c = 560 \text{ N/mm}^2$ and $a = \frac{1}{1600}$ for pinned ends Euler's formula with E for C. I. = 1.2 x 10⁵ N/mm² 1)
 - 2)
- 02 Q.3 Explain 'Principal planes and principal stresses'. a) At a point in a strained material, the principal stresses are 100 N/mm² and 07 b) 40 N/mm² both tensile. Find the normal, tangential and resultant stresses across a plane through the point at 48° to the major principal plane. Use Mohr's circle method.
- Q.4 a) Explain term 'Equivalent Torque'.
 - A solid shaft of diameter 80 mm is subjected to a twisting moment of 8 MN-07 b) mm and a bending moment of 5 MN-mm at a point. Determine
 - Principal stresses 1)

Q.7

2) Position of the plane on which they act

02 Q.5 State and explain maximum shear stress theory. a)

A bolt is subjected to an axial pull of 9 kN, accompanied with transverse 07 b) shear force of 4.5 kN. Elastic limit in tension is 225 N/mm², factor of safety =3 and Poisson's ratio =0.3. Find diameter of the bolt using maximum shear stress theory.

Section – II

- Explain Double Integration Method for finding deflection with example of Q.6 a) 03 simply supported beam.
 - A simply supported beam is having a span of 5m and subjected to a point 07 b) load 20kN at centre of the beam. Using Moment Area Method determine deflection at centre of the beam if E is 2×10^5 N/mm² and MI as 3×10^5 mm⁴.
 - Write note on- Influence line Diagram 02 a) A simply supported beam is having a span of 3m and subjected to a 07 b) moving UDL of 18kN/m over span to 1m. Draw ILD for R_A, R_B, V_x and M_x at a section 2m from left support.

Max. Marks: 56

Set

Seat	
No.	



- **b)** UDL over entire span
- c) Couple M at free end

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

STRUCTURAL MECHANICS - II

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q.1 must be solved within first half an hour on the main answer sheet page No.3.
 - 2) Use of non-programmable scientific calculator is allowed.
 - 3) Use suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose correct alternative from the option and rewrite the sentence.

1) Slope at free end of a cantilever beam carrying point load W at free end is

a) (wl/EI) c) $(wl^2/2EI)$	b) (wl ² /EI) d) (wl ³ /EI)	

- 2) Defection at center of a simply supported beam carrying UDL of w kN/m over entire span is _____.
 - a) $(5wl^4/374EI)$ b) $(5wl^4/308EI)$
 - c) $(5wl^4 / 384EI)$ d) $(5wl^4 / 388EI)$
- 3) Influence line diagrams are useful in analysis of _____.
 - a) Beams in residential structure
 - b) Beams in water tanks
 - c) Beams in bridges
 - d) None
- 4) Muller Breslau's principle is plotted for variation of _____ over entire span of beam.
 - a) Point load b) UDL
 - c) UVL d) None of the above
- 5) While converting a beam into its conjugate beam, end supports remain same. This statement is _____.
 - a) Always true b) Always false
 - c) Can't say d) Depends upon type of load
- A column carries central vertical load Q. The stresses on the section of the column will be _____.
 - a) Zero at one end and maximum at the other end
 - b) Uniform
 - c) Zero at the axis and maximum at the outer end
 - d) Tensile on one end and compressive at the other end
- 7) The normal stress on an oblique plane is maximum, when θ is equal to

a)	00	b)	30 ⁰
C)	45 ⁰	d	90 ⁰

SLR-FM-626



Max. Marks: 70

Marks: 14

Set

Page 14 of 16

- 8) Saint Venant theory is also known as, _____.
 - Maximum Shear stress theory a)
 - Maximum Strain energy theory b)
 - Maximum Principal strain theory c)
 - Maximum Principal stress theory d)
- A circular shaft of diameter D, subjected to combined twisting moment (T) 9) and bending moment (M) carries the maximum shear stress equal to,
 - b) $R(M^2 + T^2)/I$ $R\sqrt{M^2 + T^2}/J$ a)
 - d) $I(M^2 + T^2)/R$ C) $I\sqrt{M^{2}+T^{2}}/R$
- 10) The normal stress on an oblique plane is minimum, when θ is equal to

	•		
a)	0 ⁰	b)	45 ⁰
c)	30 ⁰	d)	90 ⁰

- The Euler's empirical formula is useful for, ____ 11)
 - Long columns Both a) and b) a) b)
 - Short columns d) None c)
- A loaded column is having tendency to deflect on account of this 12) tendency, the critical load, ____
 - a) Decreases with decrease is length
 - b) First decreases then increases with decrease in length
 - Decreases with increase in length C)
 - d) First increases then decreases with decrease in length

b)

- The expression EI (d^2y/dx^2) gives the value of _____. 13)
 - Slope

a)

- b) Bending moment Rate of loading
- Shear force d) c)
- Free end in actual beam is _____ in conjugate beam. 14) Fixed
 - Free a)
 - Simply supported d) Roller C)

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering STRUCTURAL MECHANICS - II**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from remaining in Section I.
- 3) Solve any two questions from remaining in Section II.
- 4) Assume suitable data if required and mention it clearly.

Section – I

- Q.2 Enlist different end conditions of columns and state their effective lengths. a) 03 Draw neat sketches of effective lengths. A 1.5 m long column has a circular cross section of 50 mm diameter. One 07
 - b) of the ends of the column is fixed in direction and position and the other is free. Taking factor of safety as 3, calculate the safe load using:
 - Rankine's formula with $f_c = 560 \text{ N/mm}^2$ and $a = \frac{1}{1600}$ for pinned ends Euler's formula with E for C. I. = 1.2 x 10⁵ N/mm² 1)
 - 2)
- Q.3 Explain 'Principal planes and principal stresses'. a) At a point in a strained material, the principal stresses are 100 N/mm² and 07 b) 40 N/mm² both tensile. Find the normal, tangential and resultant stresses across a plane through the point at 48° to the major principal plane. Use Mohr's circle method.
- Q.4 a) Explain term 'Equivalent Torque'.
 - A solid shaft of diameter 80 mm is subjected to a twisting moment of 8 MN-07 b) mm and a bending moment of 5 MN-mm at a point. Determine
 - Principal stresses 1)

Q.7

2) Position of the plane on which they act

02 Q.5 State and explain maximum shear stress theory. a)

A bolt is subjected to an axial pull of 9 kN, accompanied with transverse 07 b) shear force of 4.5 kN. Elastic limit in tension is 225 N/mm², factor of safety =3 and Poisson's ratio =0.3. Find diameter of the bolt using maximum shear stress theory.

Section – II

- Explain Double Integration Method for finding deflection with example of Q.6 a) 03 simply supported beam.
 - A simply supported beam is having a span of 5m and subjected to a point 07 b) load 20kN at centre of the beam. Using Moment Area Method determine deflection at centre of the beam if E is 2×10^5 N/mm² and MI as 3×10^5 mm⁴.
 - Write note on- Influence line Diagram 02 a) A simply supported beam is having a span of 3m and subjected to a 07 b) moving UDL of 18kN/m over span to 1m. Draw ILD for R_A , R_B , V_X and M_x at a section 2m from left support.

Max. Marks: 56

Set

SLR-FM-626

Seat No.

02





Q.8 A simply supported beam is having a span of 5m and subjected to a point load 50kN at centre of the beam. Using conjugate beam method determines deflection at centre of the beam if E is $2x10^5$ N/mm² and MI as $8x10^4$ mm⁴.



- a) Point load W at free end
- **b)** UDL over entire span
- c) Couple M at free end

C)	Analytical resection	d)	Radiation	
The wav calle	instruments which provide elect e length or a band of wave lengt ed	romag hs to i	netic radiation of specified illuminate the earth surface, ar	e
a)	Passive sensors	b)	Active Sensors	
c)	Scanner	d)	None of these	
The text	arrangement of terrain features ure of	which	provides the shape, size and	
a)	Spectral variation	b)	Temporal variation	
c)	Radiometric variation	d)	Spatial variation	
				Page 1 d

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING – II Day & Date: Saturday, 23-11-2019 Max. Marks: 70 Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to the right indicate full marks.

GPS user segment consists of _

a) Satellites

c) Receiver

c) Navigational data

a) Code

MCQ/Objective Type Questions

Choose the correct alternatives from the options and rewrite the sentence.

b)

d)

b)

d)

Signal

Carrier

Ephemeris

Atomic clock

3) Civil signal which provides least accurate position is _____ a) C/A b) L1

c) L2C d) L5

Most important component of GPS signal is _

Fundamental type/s of GPS observables used for GPS positioning is/are 4)

	•		
a)	One	b)	Two
C)	Three	d)	four

			L L		u)) 10	
~ ~	~						

5) GPS provides WGS84 coordinates in

- a) Cartesian system Geodetic system b)
- c) Either system Both systems d)

6) Data for most precise position may be obtained from

- a) Autonomous static method b) Relative static method
- c) DGPS method d) **RTK** method
- Principle of GPS positioning is _ 7)
 - a) Resection b) Intersection
 - c) Analytical
- The instrumer 8) wave length o called _____.
 - Passive s a)
 - c) Scanner

SLR-FM-627



Seat No.

Q.1

Duration: 30 Minutes

1)

2)

9)

Marks: 14

10) The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as

a) Ozone hole

b) Atmospheric window

SLR-FM-627

Set

- c) Ozone window d)
- Black hole
- 11) In remote sensing _____ resolution is used to distinguish closed spaced objects on an image.
 - a) Radiometric Active Sensors Spatial b)
 - c) Temporal
- Spectral d)

TIN is _ 12) __.

a)

c)

- a) Triangular Irregular Network
- b) Taxpayer Identification Number
- c) Triangulated Irregular Network
- d) Total Irregular Network
- A plant with more chlorophyll will reflect more: ____ 13) Ultraviolet energy
 - b) Emitted energy
 - Near-infrared C) d) Thermal infrared
- The normal altitude of near polar orbiting remote sensing satellite is about: 14)
 - 20,200 km Ultraviolet energy a)
- b) 850 km Emitted energy 2050 km Thermal infrared d)
- 1050 km Near-infrared

Page 2 of 12

05

04

SLR-FM-627

Seat No.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 is compulsory. Answer any two out of Q.3, to Q.5. 2) Q.6 is compulsory. Answer any two out of Q.7 to Q. 9.

Section – I

Q.2 Explain the sketch.

- a) Subtense Bar method of Tacheometry.
- **b)** Compare the Chord produced method with the Rankines method.
- Q.3 Solve.
 - a) A tacheometer is placed at a station A and readings on a staff held vertical upon a B.M. of RL=100.0 meter and at station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 m respectively. The angle of depression of the telescope in the first case is 6°19' and in the second case is 7°42'. Find the horizontal distance from A to B and the RL of station B, if the instrument has constants 100 and 0.5
 - b) In a tangential method of tacheometry two vanes were fixed 2 m apart, the lower vane being 0.5 m above the foot of the staff held vertical at station A. The vertical angles measured are +1°12' and -1°30'. Find the horizontal distance of A and reduced level of A, if the R.L. of the observation station is 101.365 m and height of instrument is 1.230 m.
- **Q.4 a)** Define vertical curves. What is ideal shape for vertical curve and why? **04**
 - b) Explain methods of calculating the length of transition curves.
 5 a) Explain the Differential Global Positioning System.
 05
- Q.5 a) Explain the Differential Global Positioning System.b) Explain the types of GPS receivers.

Section – II

- Q.6 a) A pair of photographs are captured with an aerial camera from an altitude of 3000 m above MSL. The mean principal base measured is equal to 100 mm. The difference in parallax between two points is 3.48 mm. Find the difference in height between the two points if the elevation of the lower point is 600 m above datum.
 - b) A photograph is acquired from a height of 2000 m with a camera of focal length 20 cm. The height of a point above the datum is 2 m. The image coordinates of the point is (2, 4). Find the ground coordinates of the point.
- Q.7 a) What are the uses of point, line and polygon layer in feature representation 05 in geographic information system; explain with the help of suitable examples.
 - **b)** Explain the tools in Geographic Information System software. **04**

Q.8 Write detailed note on.

- a) Platforms in Remote Sensing.
- **b)** Idealized remote sensing system.

Q.9 Explain the Project Survey for.

a) Culvert 05 b) Highway 04

Max. Marks: 56

Set

10

Set

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

C)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The instruments which provide electromagnetic radiation of specified 1) wave length or a band of wave lengths to illuminate the earth surface, are called .
 - a) Passive sensors Scanner
- b) **Active Sensors**

Temporal variation

- d) None of these
- 2) The arrangement of terrain features which provides the shape, size and texture of _____.
 - a) Spectral variation
 - c) Radiometric variation Spatial variation d)
- 3) The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as ____

b)

- a) Ozone hole b) c) Ozone window
 - Atmospheric window d) Black hole

Signal

- In remote sensing _____ resolution is used to distinguish closed spaced 4) objects on an image.
 - a) Radiometric Active Sensors Spatial b) d) Spectral
 - c) Temporal
- TIN is _ 5)

C)

- a) Triangular Irregular Network
- b) Taxpayer Identification Number
- c) Triangulated Irregular Network
- d) Total Irregular Network
- 6) A plant with more chlorophyll will reflect more:
 - Ultraviolet energy Emitted energy a) b)
 - c) Near-infrared Thermal infrared d)
- 7) The normal altitude of near polar orbiting remote sensing satellite is about:
 - 20.200 km Ultraviolet energy 850 km Emitted energy b) a)
 - 1050 km Near-infrared 2050 km Thermal infrared d)
- GPS user segment consists of ____ 8) b)
 - Satellites a)
 - Atomic clock Receiver c) d)



Max. Marks: 70

Marks: 14

			Set			
9)	Most important component of GPS a) Code c) Navigational data	signal b) d)	is Carrier Ephemeris			
10)	Civil signal which provides least acc a) C/A c) L2C	curate b) d)	position is L1 L5			
11)) Fundamental type/s of GPS observables used for GPS positioning is/are					
	a) One c) Three	b) d)	Two four			
12)	GPS provides WGS84 coordinatesa) Cartesian systemc) Either system	in b) d)	 Geodetic system Both systems			
13)	Data for most precise position maya) Autonomous static methodc) DGPS method	be ob b) d)	tained from Relative static method RTK method			
14)	Principle of GPS positioning is		Interportion			

- Intersection
- a) Resectionc) Analytical resection b) d) Radiation

Q

05

04

SLR-FM-627

Seat No.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING - II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 is compulsory. Answer any two out of Q.3, to Q.5. 2) Q.6 is compulsory. Answer any two out of Q.7 to Q.9.

Section – I

Q.2 Explain the sketch.

- Subtense Bar method of Tacheometry. a)
- Compare the Chord produced method with the Rankines method. b)
- Q.3 Solve.
 - A tacheometer is placed at a station A and readings on a staff held vertical 05 a) upon a B.M. of RL=100.0 meter and at station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 m respectively. The angle of depression of the telescope in the first case is 6°19' and in the second case is 7°42'. Find the horizontal distance from A to B and the RL of station B, if the instrument has constants 100 and 0.5
 - b) In a tangential method of tacheometry two vanes were fixed 2 m apart, the 04 lower vane being 0.5 m above the foot of the staff held vertical at station A. The vertical angles measured are +1°12' and -1°30'. Find the horizontal distance of A and reduced level of A, if the R.L. of the observation station is 101.365 m and height of instrument is 1.230 m.
- Q.4 a) Define vertical curves. What is ideal shape for vertical curve and why? 04 05
 - Explain methods of calculating the length of transition curves. b) Explain the Differential Global Positioning System. 05 a)
- Q.5 Explain the types of GPS receivers. b)

Section – II

- A pair of photographs are captured with an aerial camera from an altitude Q.6 a) 05 of 3000 m above MSL. The mean principal base measured is equal to 100 mm. The difference in parallax between two points is 3.48 mm. Find the difference in height between the two points if the elevation of the lower point is 600 m above datum. 05
 - A photograph is acquired from a height of 2000 m with a camera of focal b) length 20 cm. The height of a point above the datum is 2 m. The image coordinates of the point is (2, 4). Find the ground coordinates of the point.
- Q.7 What are the uses of point, line and polygon layer in feature representation 05 a) in geographic information system; explain with the help of suitable examples.
 - Explain the tools in Geographic Information System software. 04 b) Write detailed note on.
 - a) Platforms in Remote Sensing. 05 Idealized remote sensing system. 04 b)

Explain the Project Survey for. Q.9

Q.8

Culvert a) Highway b)

Max. Marks: 56

Set

10

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - 1) GPS provides WGS84 coordinates in
 - a) Cartesian system
 - b) c) Either system d)
 - 2) Data for most precise position may be obtained from _
 - a) Autonomous static method Relative static method b)

Geodetic system

Both systems

RTK method

- c) DGPS method d)
- 3) Principle of GPS positioning is _
 - a) Resection Intersection b)
 - c) Analytical resection d) Radiation
- The instruments which provide electromagnetic radiation of specified 4) wave length or a band of wave lengths to illuminate the earth surface, are called . **Active Sensors**
 - Passive sensors a) b)
 - None of these c) Scanner d)
- The arrangement of terrain features which provides the shape, size and 5) texture of _____.
 - Spectral variation a) b) **Temporal variation**
 - c) Radiometric variation Spatial variation d)
- The spectral region of the electromagnetic radiation which passes through 6) the atmosphere without much attenuation is known as
 - a) Ozone hole
 - b) Atmospheric window d) Black hole
- In remote sensing _____ resolution is used to distinguish closed spaced 7) objects on an image.
 - a) Radiometric Active Sensors b) Spatial d) Spectral
 - c) Temporal

c) Ozone window

- 8) TIN is
 - **Triangular Irregular Network** a)
 - b) Taxpayer Identification Number
 - c) Triangulated Irregular Network
 - d) Total Irregular Network

SLR-FM-627



Max. Marks: 70

Marks: 14

SLR-FM-627 Set R 9) A plant with more chlorophyll will reflect more: _____. a) Ultraviolet energy b) Emitted energy c) Near-infrared d) Thermal infrared The normal altitude of near polar orbiting remote sensing satellite is about: 10) 20,200 km Ultraviolet energy b) 850 km Emitted energy a) 1050 km Near-infrared 2050 km Thermal infrared C) d) 11) GPS user segment consists of __ a) Satellites b) Signal c) Receiver d) Atomic clock Most important component of GPS signal is ____ 12) . Code Carrier a) b) Navigational data d) **Ephemeris** C) Civil signal which provides least accurate position is _____ 13) C/A b) L1 a) L5 c) L2C d) Fundamental type/s of GPS observables used for GPS positioning is/are 14)

a) One b) Two c) Three d) four
05

04

SLR-FM-627

Seat No.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 is compulsory. Answer any two out of Q.3, to Q.5. 2) Q.6 is compulsory. Answer any two out of Q.7 to Q. 9.

Section – I

Q.2 Explain the sketch.

- a) Subtense Bar method of Tacheometry.
- **b)** Compare the Chord produced method with the Rankines method.
- Q.3 Solve.
 - a) A tacheometer is placed at a station A and readings on a staff held vertical upon a B.M. of RL=100.0 meter and at station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 m respectively. The angle of depression of the telescope in the first case is 6°19' and in the second case is 7°42'. Find the horizontal distance from A to B and the RL of station B, if the instrument has constants 100 and 0.5
 - b) In a tangential method of tacheometry two vanes were fixed 2 m apart, the lower vane being 0.5 m above the foot of the staff held vertical at station A. The vertical angles measured are +1°12' and -1°30'. Find the horizontal distance of A and reduced level of A, if the R.L. of the observation station is 101.365 m and height of instrument is 1.230 m.
- Q.4 a) Define vertical curves. What is ideal shape for vertical curve and why? 04
 - b) Explain methods of calculating the length of transition curves.
 5 a) Explain the Differential Global Positioning System.
 05
- Q.5 a) Explain the Differential Global Positioning System.b) Explain the types of GPS receivers.

Section – II

- Q.6 a) A pair of photographs are captured with an aerial camera from an altitude of 3000 m above MSL. The mean principal base measured is equal to 100 mm. The difference in parallax between two points is 3.48 mm. Find the difference in height between the two points if the elevation of the lower point is 600 m above datum.
 - b) A photograph is acquired from a height of 2000 m with a camera of focal length 20 cm. The height of a point above the datum is 2 m. The image coordinates of the point is (2, 4). Find the ground coordinates of the point.
- Q.7 a) What are the uses of point, line and polygon layer in feature representation 05 in geographic information system; explain with the help of suitable examples.
 - **b)** Explain the tools in Geographic Information System software. **04**

Q.8 Write detailed note on.

- a) Platforms in Remote Sensing.
- **b)** Idealized remote sensing system.

Q.9 Explain the Project Survey for.

a) Culvert 05 b) Highway 04



Set

10

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The spectral region of the electromagnetic radiation which passes through 1) the atmosphere without much attenuation is known as _
 - a) Ozone hole

Ozone window

- b)
- 2) In remote sensing resolution is used to distinguish closed spaced
 - objects on an image. a) Radiometric Active Sensors
 - c) Temporal
- 3)
 - TIN is a) Triangular Irregular Network
 - b) Taxpayer Identification Number
 - **Triangulated Irregular Network** c)
 - d) Total Irregular Network
- A plant with more chlorophyll will reflect more: 4)
 - a) Ultraviolet energy b) Emitted energy
 - Thermal infrared Near-infrared d) c)
- 5) The normal altitude of near polar orbiting remote sensing satellite is about:
 - 20,200 km Ultraviolet energy b) a)
 - 1050 km Near-infrared C)
- 6) GPS user segment consists of _____
 - Satellites b) Signal a) Receiver d) Atomic clock C)
- 7) Most important component of GPS signal is
 - Carrier Code b) a)
 - Ephemeris Navigational data d) c)
- 8) Civil signal which provides least accurate position is _____
 - a) C/A b) L1 c) L2C d) L5

Seat No.

Max. Marks: 70

Marks: 14

Atmospheric window

Black hole

- d)
- b) Spatial
 - Spectral d)

- - 850 km Emitted energy
 - 2050 km Thermal infrared d)

9) Fundamental type/s of GPS observables used for GPS positioning is/are One Two a) b) d) four C) Three 10) GPS provides WGS84 coordinates in a) Cartesian system b) Geodetic system Either system d) Both systems C) Data for most precise position may be obtained from _ 11) Autonomous static method Relative static method b) a) DGPS method d) RTK method C) Principle of GPS positioning is ____ 12) a) Resection b) Intersection c) Analytical resection Radiation d) The instruments which provide electromagnetic radiation of specified 13) wave length or a band of wave lengths to illuminate the earth surface, are called . **Active Sensors** a) Passive sensors b) c) Scanner d) None of these 14) The arrangement of terrain features which provides the shape, size and texture of _____. Spectral variation b) **Temporal variation** a)

- Radiometric variation c)
- Spatial variation

Page **11** of **12**

S Set

SLR-FM-627

- d)

05

04

SLR-FM-627

Seat No.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering SURVEYING – II

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 is compulsory. Answer any two out of Q.3, to Q.5. 2) Q.6 is compulsory. Answer any two out of Q.7 to Q. 9.

Section – I

Q.2 Explain the sketch.

- a) Subtense Bar method of Tacheometry.
- **b)** Compare the Chord produced method with the Rankines method.
- Q.3 Solve.
 - a) A tacheometer is placed at a station A and readings on a staff held vertical upon a B.M. of RL=100.0 meter and at station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 m respectively. The angle of depression of the telescope in the first case is 6°19' and in the second case is 7°42'. Find the horizontal distance from A to B and the RL of station B, if the instrument has constants 100 and 0.5
 - b) In a tangential method of tacheometry two vanes were fixed 2 m apart, the lower vane being 0.5 m above the foot of the staff held vertical at station A. The vertical angles measured are +1°12' and -1°30'. Find the horizontal distance of A and reduced level of A, if the R.L. of the observation station is 101.365 m and height of instrument is 1.230 m.
- Q.4 a) Define vertical curves. What is ideal shape for vertical curve and why?
 O4 b) Explain methods of calculating the length of transition curves.
 O5
 - b) Explain methods of calculating the length of transition curves.
 5 a) Explain the Differential Global Positioning System.
 05
- Q.5 a) Explain the Differential Global Positioning System.b) Explain the types of GPS receivers.

Section – II

- Q.6 a) A pair of photographs are captured with an aerial camera from an altitude of 3000 m above MSL. The mean principal base measured is equal to 100 mm. The difference in parallax between two points is 3.48 mm. Find the difference in height between the two points if the elevation of the lower point is 600 m above datum.
 - b) A photograph is acquired from a height of 2000 m with a camera of focal length 20 cm. The height of a point above the datum is 2 m. The image coordinates of the point is (2, 4). Find the ground coordinates of the point.
- Q.7 a) What are the uses of point, line and polygon layer in feature representation 05 in geographic information system; explain with the help of suitable examples.
 - b) Explain the tools in Geographic Information System software.04Write detailed note on.
 - a) Platforms in Remote Sensing.
 b) Idealized remote sensing system.
 04

Q.9 Explain the Project Survey for.

Q.8

a) Culvert
 b) Highway

Max. Marks: 56

Set

10

Set S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

BUILDING CONSTRUCTION & DESIGN

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- Figures to the right indicate full marks.
- 3) Assume suitable data as per requirement and mention it.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The aggregate minimum area of window opening for light and ventilation in dry climate is floor area _____.
 - a) 1/8th 1/5th 1/10th d) c)
- In assembly halls _____ M³ fresh air exchange (Per person/hour) is 2) recommended.
 - a) 10m³ b) 20m³ 40m³ d)
 - c) 28m³
- For National Highways in urban areas building line is located at distance 3) of _____.

a)	30m	b)	45m
c)	15m	d)	25m

- 4) The minimum heights for habitable rooms
 - a) 2.75m 2.4m b) c) 2.6m d) 2.2m
- Hot-Arid Zones is also called ____ 5)
 - a) Dry-Arid Zones b) Wet-Zones c) Wet-Arid Zones None of these d)
- 6) FSI means _____ in building planning.
 - a) Fire to safety index b) Fuel space index c) Fire to smoke index
 - d) Floor to space index
- 7) For kitchen cum dining room the minimum area should be _____.
 - a) 5 Sq.m b) 9.5 Sq.m
 - c) 6 Sq.m d) 15 Sq.m
- System of air conditioning is _____. 8)
 - b) a) Central system Self-contained system c) Combined system d) All of the above

SLR-FM-628

Max. Marks: 70

Marks: 14

1/20th b)



9) Height of the building is restricted by a line drawn from rear boundary of plot at angle of _____.

a)	$33\frac{1^{0}}{2}$	b)	$43\frac{1^{0}}{2}$
c)	$53\frac{1^{0}}{2}$	d)	$63\frac{\overline{1^{0}}}{2}$

- 10) _____ means the movement space provided on the same floor either between the rooms or within the rooms.
 - a) Prospect b) Circulation
 - c) Grouping d) Flexibility
- 11) Ventilation involves placement of windows in both windward and leeward walls.
 - a) Lateral b) Diagonal
 - c) Cross d) Indirect
- 12) In a residential building corridors and passage require minimum _____ air change per hour.
 - a) One b) Two
 - c) Three d) Four
- 13) Residual Head in the water pipeline is the head available at the _____ the distribution system.
 - a) Beginningc) Quarter length
- b) Tail end
- d) All of the above
- 14) The requirements for fitments for drainage and sanitation are given in _____.
 - a) IS: 1172:1963

c) IS: 456:1972

b) IS: 774:1971d) IS: 962:1989

Seat No.						Set	Ρ	
Day &	Dat	S.E. (Part – II) BUIL e: Monday, 25-11	Old) (CGPA) E Civil Engi DING CONSTRU -2019	Examination I neering ICTION & DE	Nov/Dec-2019 SIGN Max.	Marks	3: 56	
Instru	ictio	ns: 1) All question 2) Figures to	ns are compulsory. The right indicate ful	l marks.				
Q.2	Desi Prov 1) 2) 3) 4) 5) a) b)	gn and Draw to s ide for the followi A living room A kitchen Two Bed room Sufficient toilet fa Staircase Draw typical plar Draw sectional e details.	cale of 1:50 a bungang areas/rooms. ncility n, 1:50 & show all de levation for above n	alow for an Exec etails. nentioned plan, s	sutive Engineer scale 1:50 & show	v all	14 14	
Q.3	Writ a) b) c)	e any four of the Explain Principle Write importance Draw sketches o 1) S.W. pipe 2) A.C. down ta	following. s of Building Planni of Maintenance. f ke pipe with bend?	ng?			07 07 07	
	d) e) f)	Write a note on w What is thermal i Explain system of	arious defects in pl nsulation? Explain a f Air – Conditioning	astering? anyone method in summer?	of thermal insulati	on?	07 07 07	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DESIGN

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data as per requirement and mention it.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) System of air conditioning is _____
 - a) Central system
 - c) Combined system d) All of the above
- Height of the building is restricted by a line drawn from rear boundary of plot at angle of _____.

a)	$33\frac{1^{0}}{2}$	b)	$43\frac{1^{0}}{2}$
c)	$53\frac{\bar{1^0}}{2}$	d)	$63\frac{\bar{1}^{0}}{2}$

3) _____ means the movement space provided on the same floor either between the rooms or within the rooms.

a)	Prospect	b)	Circulation
``	<u> </u>	1)	

- c) Grouping d) Flexibility
- 4) Ventilation involves placement of windows in both windward and leeward walls.
 - a) Lateral b) Diagonal
 - c) Cross d) Indirect
- 5) In a residential building corridors and passage require minimum _____ air change per hour.

a)	One	b)	Two
C)	Three	d)	Four

- Residual Head in the water pipeline is the head available at the _____ the distribution system.
 - a) Beginning b) Tail end
 - c) Quarter length d) All of the above
- 7) The requirements for fitments for drainage and sanitation are given in _____.
 - a) IS: 1172:1963 b) IS: 774:1971
 - c) IS: 456:1972 d) IS: 962:1989
- 8) The aggregate minimum area of window opening for light and ventilation in dry climate is floor area _____.
 - a) $1/8^{th}$ b) $1/20^{th}$
 - c) $1/5^{th}$ d) $1/10^{th}$

Max. Marks: 70

Marks: 14

Set (-2019

b)

Self-contained system

			Set	Q
9)	In assembly halls M ³ fresh air recommended. a) 10m ³ c) 28m ³	[.] exch b) d)	ange (Per person/hour) is 20m ³ 40m ³	
10)	For National Highways in urban area of a) 30m c) 15m	as buil b) d)	ding line is located at distance 45m 25m	
11)	The minimum heights for habitable real 2.75m c) 2.6m	ooms b) d)	2.4m 2.2m	
12)	Hot-Arid Zones is also calleda) Dry-Arid Zonesc) Wet-Arid Zones	b) d)	Wet-Zones None of these	
13)	FSI means in building plannina) Fire to safety indexc) Fire to smoke index	ng. b) d)	Fuel space index Floor to space index	
14)	For kitchen cum dining room the min a) 5 Sq.m	nimum b)	area should be 9.5 Sq.m	

c) 6 Sq.m d) 15 Sq.m

SLR-FM-628

Seat No.				S	Set	Q
Day & Time: Instru	Dati 02:3 Ictio	S.E. (Part – II) BUIL e: Monday, 25-11 60 PM To 06:30 Pl ns: 1) All question 2) Figures to	(Old) (CGPA) Exam Civil Engineer DING CONSTRUCTI 2019 A s are compulsory. he right indicate full mar	ination Nov/Dec-2019 ing ON & DESIGN Max. Max. Max. Max. Max. Max. Max. Max.	Marks	s: 56
Q.2	Desi Prov 1) 2) 3) 4) 5) a) b)	ign and Draw to s ide for the following A living room A kitchen Two Bed room Sufficient toilet fa Staircase Draw typical plan Draw sectional e details.	ale of 1:50 a bungalow f ng areas/rooms. cility , 1:50 & show all details. evation for above mentic	or an Executive Engineer ned plan, scale 1:50 & show	all	14 14
Q.3	Writ a) b) c)	e any four of the Explain Principle Write importance Draw sketches o 1) S.W. pipe 2) A.C. down ta	following. s of Building Planning? of Maintenance. ke pipe with bend?			07 07 07
	d) e) f)	Write a note on w What is thermal i Explain system of	arious defects in plasteri nsulation? Explain anyor f Air – Conditioning in su	ng? e method of thermal insulatio mmer?	n?	07 07 07

Se

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING CONSTRUCTION & DESIGN

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data as per requirement and mention it.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Hot-Arid Zones is also called _____
 - a) Dry-Arid Zones b) Wet-Zones
 - c) Wet-Arid Zones d) None of these
- 2) FSI means _____ in building planning.
 - a) Fire to safety index b) Fuel space index
 - c) Fire to smoke index d) Floor to space index

3) For kitchen cum dining room the minimum area should be _____.

- a) 5 Sq.m b) 9.5 Sq.m
- c) 6 Sq.m d) 15 Sq.m
- 4) System of air conditioning is _____.
 - a) Central system b) Self-contained system
 - c) Combined system d) All of the above
- 5) Height of the building is restricted by a line drawn from rear boundary of plot at angle of _____.

a)	$33\frac{1^{0}}{2}$	b)	$43\frac{1^{0}}{2}$
c)	$53\frac{\overline{1^0}}{2}$	d)	$63\frac{\bar{1^0}}{2}$

6) _____ means the movement space provided on the same floor either between the rooms or within the rooms.

a)	Prospect	b)	Circulation
-	Creating a	, L	

- c) Grouping d) Flexibility
- 7) Ventilation involves placement of windows in both windward and leeward walls.
 - a) Lateral b) Diagonal
 - c) Cross d) Indirect
- In a residential building corridors and passage require minimum _____ air change per hour.

a)	One	b)	Two
c)	Three	d)	Four

5

Max. Marks: 70

Marks: 14

Set R

SLR-FM-628

			SLR-FM-628	3
			Set R)
9)	Residual Head in the water pipeline distribution system. a) Beginning c) Quarter length	e is the b) d)	e head available at the the Tail end All of the above	
10)	The requirements for fitments for dr a) IS: 1172:1963 c) IS: 456:1972	ainag b) d)	e and sanitation are given in IS: 774:1971 IS: 962:1989	
11)	The aggregate minimum area of win in dry climate is floor area a) 1/8 th c) 1/5 th	ndow b) d)	opening for light and ventilation 1/20 th 1/10 th	
12)	In assembly halls M ³ fresh a recommended. a) 10m ³ c) 28m ³	ir excł b) d)	nange (Per person/hour) is 20m ³ 40m ³	
13)	For National Highways in urban are of a) 30m c) 15m	eas bu b) d)	ilding line is located at distance 45m 25m	
14)	The minimum heights for habitable a) 2.75m	rooms b)	s 2.4m	

a) 2.75mb) 2.4mc) 2.6md) 2.2m

Seat No.					S	Set	R	
Day 8 Time: Instru	Dati 02:3	S.E. (Part – II) BUIL e: Monday, 25-11 0 PM To 06:30 Pl ns: 1) All question 2) Figures to	(Old) (CGPA) E Civil Engir DING CONSTRU 2019 A is are compulsory. he right indicate full	xamination N eering CTION & DES marks.	lov/Dec-2019 SIGN Max. M	Marks	56	
Q.2	Desi Prov 1) 2) 3) 4) 5) a) b)	gn and Draw to se ide for the followin A living room A kitchen Two Bed room Sufficient toilet fa Staircase Draw typical plan Draw sectional e details.	cale of 1:50 a bungang areas/rooms. cility , 1:50 & show all de evation for above m	low for an Exect tails. entioned plan, s	utive Engineer cale 1:50 & show	all	14 14	
Q.3	Writ a) b) c)	e any four of the Explain Principle Write importance Draw sketches o 1) S.W. pipe 2) A.C. down ta	following. s of Building Plannir of Maintenance. ke pipe with bend?	ıg?			07 07 07	
	d) e) f)	Write a note on w What is thermal i Explain system of	arious defects in pla nsulation? Explain a f Air – Conditioning	istering? nyone method c in summer?	f thermal insulatio	n?	07 07 07	

Set

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering BUILDING CONSTRUCTION & DESIGN**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

3) Assume suitable data as per requirement and mention it.

MCQ/Objective Type Questions

Duration: 30 Minutes

3)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- _ means the movement space provided on the same floor either 1) between the rooms or within the rooms.
 - a) Prospect b) Circulation
 - d) Flexibility c) Grouping
- 2) Ventilation involves placement of windows in both windward and leeward walls.
 - a) Lateral b) Diagonal
 - d) Indirect c) Cross In a residential building corridors and passage require minimum _____ air
 - change per hour.
 - a) One Two b)
 - c) Three d) Four
- 4) Residual Head in the water pipeline is the head available at the _____ the distribution system.
 - a) Beginning b) Tail end
 - c) Quarter length All of the above d)
- 5) The requirements for fitments for drainage and sanitation are given in _____.
 - a) IS: 1172:1963 IS: 774:1971 b)
 - c) IS: 456:1972 d) IS: 962:1989
- The aggregate minimum area of window opening for light and ventilation 6) in dry climate is floor area
 - 1/20th a) 1/8th b)
 - c) 1/5th 1/10th d)
- In assembly halls _____ M³ fresh air exchange (Per person/hour) is 7) recommended.
 - 20m³ a) 10m³ b)
 - c) 28m³ 40m^3 d)
- For National Highways in urban areas building line is located at distance 8) of
 - 30m a) b) 45m C) 15m d) 25m

Max. Marks: 70

Marks: 14

Set S

9)	The minimum heights for habitable rooms	
----	---	--

- a) 2.75m b) 2.4m c) 2.6m d) 2.2m
- 10) Hot-Arid Zones is also called _____.
 - a) Dry-Arid Zones b) Wet-Zones
 - c) Wet-Arid Zones d) None of these
- 11) FSI means _____ in building planning.
 - a) Fire to safety index b) Fuel space index
 - c) Fire to smoke index d) Floor to space index

12) For kitchen cum dining room the minimum area should be _____.

- a) 5 Sq.m b) 9.5 Sq.m
- c) 6 Sq.m d) 15 Sq.m
- 13) System of air conditioning is _____.a) Central system
- b) Self-contained system
- c) Combined system d) All of the above
- 14) Height of the building is restricted by a line drawn from rear boundary of plot at angle of _____.
 - a) $33\frac{1^{0}}{2}$ c) $53\frac{1^{0}}{2}$ d) $63\frac{1^{0}}{2}$

Seat No.					Set	S	
Day 8 Time: Instru	a Dat 02:3 uctio	S.E. (Part – II) BUIL e: Monday, 25-11 0 PM To 06:30 Pl ns: 1) All questior	(Old) (CGPA) E Civil Engi DING CONSTRU 2019 A Is are compulsory.	Examination Nov/Dec neering JCTION & DESIGN	- 2019 Max. Marks	s: 56	
Q.2	Desi Prov 1) 2) 3) 4) 5) a) b)	2) Figures to ign and Draw to so ide for the followin A living room A kitchen Two Bed room Sufficient toilet fa Staircase Draw typical plan Draw sectional e details.	he right indicate ful cale of 1:50 a bung ng areas/rooms. cility , 1:50 & show all de evation for above r	ll marks. alow for an Executive Eng etails. nentioned plan, scale 1:50	ineer) & show all	14 14	
Q.3	Writ a) b) c)	e any four of the Explain Principle Write importance Draw sketches o 1) S.W. pipe 2) A.C. down ta	following. s of Building Planni of Maintenance. ke pipe with bend?	ng?		07 07 07	
	d) e) f)	Write a note on w What is thermal i Explain system o	arious defects in pl nsulation? Explain f Air – Conditioning	astering? anyone method of therma i in summer?	l insulation?	07 07 07	

Seat	
No.	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of non-programmable calculator is permitted.
- 3) Assume any other data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The channel whose boundary is not deformable is known as _
 - a) Rigid channel b) Prismatic channel
 - c) Mobile channel d) Boundary channel
- 2) In open channel the specific energy is _____
 - a) The total energy per unit discharge
 - b) The total energy measured above a horizontal datum
 - c) The total energy measured with respect to the channel bottom
 - d) The Kinetic energy plotted above the free surface

3) Mannings and chezy's formule are valid for _____

- a) Steady flow b) Steady uniform flow
- c) Steady non-uniform flow d) Unsteady uniform flow
- When bottom slope is greater than critical slope the channel slope is termed as _____.
 - a) Horizantal b) Mild
 - c) Critical d) Steep

5) The article depth meter is used to measure _____.

- a) Velocity of flow in an open channel
- b) Depth of flow in an open channel
- c) Hydraulic Jump
- d) Depth of channel

6) The side slope of cipolletti weir is generally kept _____.

- a) 1 to 3 b) 1:5 c) 1 to 4
- c) 1 to 4 d) 1 to 2
- 7) The ratio of the percentage error in the discharge and percentage error in the measurements of head over a triangular notch is _____.
 - a) 2/3 b) 2/5 c) 5/2 d) 3/2
- 8) The force exerted by a jet impinging normally on a fixed plate is _____
 - a) $\frac{\varrho av}{4}$ b) ϱav c) $\frac{\varrho av^2}{4}$ d) ϱav^2

Set

Max. Marks: 70

Marks: 14

Set P

- 9) A Turbine is a device which convert _____.
 - a) Kinetic energy into mechanical energy
 - b) Mechanical energy into hydraulic energy
 - c) Hydraulic energy into mechanical energy
 - d) None of the above
- A draft tube is not required for a ____ 10)
 - b) Kaplan turbine a) Francis turbine
 - c) Pelton wheel turbine d) None of the above
- Multi stage centrifugal pumps are used to ____ 11) b) produce high heads
 - a) Give high discharge
 - c) Pump viscous fluids d) All the above
- The monometric efficiency (η_{man}) of a centrifugal pump is given by _____. 12)

a)	H_m	b)	$g.H_m$
,	$g.Vw_2.u_2$,	$Vw_2.u_2$
c)	$Vw_2.u_2$	d)	$g.Vw_2.u_2$
-/	$g.H_m$		H_m

- 13) Distorted models are required to be prepared for which of the following? a) River
 - b) Dams across very wide rivers
 - c) Harbours
 - d) All of above
- The specific speed for a turbine has the dimension of _____. 14)
 - a) T^{-1}
 - c) $F^{1/2} L^{-3/4} I^{-3/2}$
- b) Dimensionless
- d) $F^{1/2} L^{-5/2} I^{-3/2}$

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 and Q.6 are compulsory.

2) Answer any two questions from each section.

3) Use of non- programmable calculator is permitted.

- 4) Neat diagram be drawn wherever required.
- 5) Assume any other data if necessary.

Section – I

Q.2	a) b) c)	Explain the significance of channels of most efficient section. Derive the expression for loss of energy though hydraulic jump. Enlist the advantages of triangular notch over rectangular notch.	03 04 03
Q.3	a)	Derive on expression for the discharge thought a channel by chezy's formula	03
	b)	A rectangular channel 7.5m wide carries 12m ³ of water per second with a velocity of 1.5 m/sec. Compute the specific energy. Also find the depth of flow in the channel when the specific energy would be minimum. What will be the value of critical velocity as well as minimum specific energy?	06
Q.4	a)	Show that $\frac{y_2}{y_1} = \frac{1}{2} \left[\sqrt{1 + 8F_r^2} - 1 \right]$	05
	b)	for a hydraulic jump in a rectangular channel (with figure). In a rectangular channel a discharge of 2m ³ /sec per meter width flows with Froudes no.5.0. If the hydraulic jump takes place. Calculate the energy loss per meter width of channel, due to jump.	04
Q.5	a)	Derive the expression for time required to empty the tank by rectangular notch	04
	b)	A cipolletti weir of crest length 80 cm discharges water. The head of water over the weir is 420 mm. Find the discharge over the weir if the channel is 100 cm wide and 70 cm deep. Take $C_d = 0.60$	05
		Section – II	
Q.6	a) b) c)	Classify water turbines in detail. What is a primary of centrifugal pump? Distinguish between distorted models and undistorted models.	03 03 04

Q.7 a) Explain the terms, Net head, Gross head, efficiency of turbine and drafttube. **04**

Max. Marks: 56



- b) A jet of water 75 mm diameter and with velocity of 20m/ sec flows tangentially on to a stationary vane which deflects the water through 120. What is the magnitude and direction of the resultant force on the vane? If the jet flows on to a series of vanes moving in the direction of the jet with velocity 12 m/sec. Find
 - The force on the system of vanes in the direction of motion. 1)
 - 2) The work done per second
 - 3) The efficiency
- Q.8 Define the termsa)
 - 1) Suction head
 - 2) **Delivery head**
 - 3) Static head
 - 4) Manometric head
 - b) The outer diameter of an impeller of a centrifugal pump is 500 mm and 05 outlet width is 50 mm. The pump is running at 1000 r.p.m. against head 12m. The vanes angle at outlet is 35° and monometric efficiency is 80% determine.
 - Velocity of flow at outlet 1)
 - 2) Velocity of water leaving the vane and
 - Angle made by the absolute velocity at outlet with the direction motion 3) at outlet and
 - 4) Discharge
- Q.9 04 The frictional torque T of a disc of diameter D rotating at a speed N in a a) fluid of viscosity M and density ρ in a turbulent. Flow is given by

$$T = D^5 N^2 \varrho \phi \left[\frac{M}{D^2 N \varrho}\right]$$

Use Buckingham π theoram.

Find the form of the equation for discharge 'Q through a sharp- edged 05 b) triangular notch assuming Q depends on the central angle \propto of the notch, head H, gravitational acceleration 'g' and on the density ρ , viscosity μ and surface tension ' σ ' of the fluid.

05

SLR-FM-629

Set

Set

Max. Marks: 70

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of non-programmable calculator is permitted.
- 3) Assume any other data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The force exerted by a jet impinging normally on a fixed plate is 1)
 - qav a) b) oav 4 $\underline{\varrho} a v^2$ d) $\rho a v^2$ C)
 - 2) A Turbine is a device which convert
 - a) Kinetic energy into mechanical energy
 - b) Mechanical energy into hydraulic energy
 - Hydraulic energy into mechanical energy c)
 - d) None of the above
 - A draft tube is not required for a _ 3)
 - a) Francis turbine b) Kaplan turbine
 - None of the above c) Pelton wheel turbine d)
 - 4) Multi stage centrifugal pumps are used to _____
 - a) Give high discharge b) produce high heads
 - c) Pump viscous fluids d) All the above
 - The monometric efficiency (η_{man}) of a centrifugal pump is given by _____. 5)
 - H_m b) a) $g.Vw_2.u_2$ $Vw_2.u_2$ $Vw_2.u_2$ $g.Vw_2.u_2$ d) c) H_m $g.H_m$
 - 6) Distorted models are required to be prepared for which of the following? a) River
 - b) Dams across very wide rivers
 - c) Harbours
 - d) All of above
 - The specific speed for a turbine has the dimension of _ 7)
 - a) T^{-1} Dimensionless b) c) $F^{1/2} L^{-3/4} I^{-3/2}$ d) $F^{1/2} L^{-5/2} I^{-3/2}$
 - 8) The channel whose boundary is not deformable is known as
 - a) Rigid channel Prismatic channel b)
 - c) Mobile channel d) Boundary channel

g.H<u>m</u>



Marks: 14

		Set	Q	
9)	 In open channel the specific energy is a) The total energy per unit discharge b) The total energy measured above a horizontal datum c) The total energy measured with respect to the channel bottom d) The Kinetic energy plotted above the free surface 			
10)	Mannings and chezy's formule are valid for a) Steady flow b) Steady uniform flow c) Steady non-uniform flow d) Unsteady uniform flow			
11)	When bottom slope is greater than critical slope the channel slope is termed asa) Horizantalb) Mildc) Criticald) Steep			
12)	 The article depth meter is used to measure a) Velocity of flow in an open channel b) Depth of flow in an open channel c) Hydraulic Jump d) Depth of channel 			
13)	The side slope of cipolletti weir is generally kepta) 1 to 3b) 1:5c) 1 to 4d) 1 to 2			
14)	The ratio of the percentage error in the discharge and percentage error the measurements of head over a triangular notch is	ror in		

- b) d) a) 2/3 2/5 3/2
- c) 5/2

SLR-	FM-6	29
	Set	Q

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q.2 and Q.6 are compulsory.

- 2) Answer any two questions from each section.
- 3) Use of non- programmable calculator is permitted.
- 4) Neat diagram be drawn wherever required.
- 5) Assume any other data if necessary.

Section – I

Q.2	a) b) c)	Explain the significance of channels of most efficient section. Derive the expression for loss of energy though hydraulic jump. Enlist the advantages of triangular notch over rectangular notch.		
Q.3	a)	Derive on expression for the discharge thought a channel by chezy's formula	03	
	b)	A rectangular channel 7.5m wide carries 12m ³ of water per second with a velocity of 1.5 m/sec. Compute the specific energy. Also find the depth of flow in the channel when the specific energy would be minimum. What will be the value of critical velocity as well as minimum specific energy?	06	
Q.4	a)	Show that $\frac{y_2}{y_1} = \frac{1}{2} \left[\sqrt{1 + 8F_r^2} - 1 \right]$	05	
	b)	for a hydraulic jump in a rectangular channel (with figure). In a rectangular channel a discharge of 2m ³ /sec per meter width flows with Froudes no.5.0. If the hydraulic jump takes place. Calculate the energy loss per meter width of channel, due to jump.	04	
Q.5	a)	Derive the expression for time required to empty the tank by rectangular notch	04	
	b)	A cipolletti weir of crest length 80 cm discharges water. The head of water over the weir is 420 mm. Find the discharge over the weir if the channel is 100 cm wide and 70 cm deep. Take $C_d = 0.60$	05	
		Section – II		
Q.6	a) b)	Classify water turbines in detail. What is a primary of centrifugal pump?	03 03	
	C)	Distinguish between distorted models and undistorted models.	04	

Q.7 a) Explain the terms, Net head, Gross head, efficiency of turbine and draft- **04** tube.

Max. Marks: 56



- 3) Angle made by the absolute velocity at outlet with the direction motion at outlet and
- Discharge 4)

b)

Q.8

a)

b)

1)

2)

3)

1)

2)

3)

4)

1)

2)

Q.9 The frictional torque T of a disc of diameter D rotating at a speed N in a 04 a) fluid of viscosity M and density ρ in a turbulent. Flow is given by

$$T = D^5 N^2 \varrho \phi \left[\frac{M}{D^2 N \varrho} \right]$$

Use Buckingham π theoram.

Find the form of the equation for discharge 'Q through a sharp- edged 05 b) triangular notch assuming Q depends on the central angle \propto of the notch, head H, gravitational acceleration 'g' and on the density ρ , viscosity μ and surface tension ' σ ' of the fluid.

Page 8 of 16

Set

Max. Marks: 70

Marks: 14

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering FLUID MECHANICS – II**

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of non-programmable calculator is permitted.
- 3) Assume any other data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The article depth meter is used to measure . 1)
 - a) Velocity of flow in an open channel
 - b) Depth of flow in an open channel
 - c) Hydraulic Jump
 - d) Depth of channel
- 2) The side slope of cipolletti weir is generally kept _____.
 - a) 1 to 3 b) 1:5
 - d) c) 1 to 4 1 to 2
- The ratio of the percentage error in the discharge and percentage error in 3) the measurements of head over a triangular notch is _____.
 - a) 2/3 2/5b)
 - c) 5/2 d) 3/2
- 4) The force exerted by a jet impinging normally on a fixed plate is _____
 - qav b) a) oav 4 $\varrho a v^2$ d) oav^2 C)
- 5) A Turbine is a device which convert
 - a) Kinetic energy into mechanical energy
 - Mechanical energy into hydraulic energy b)
 - c) Hydraulic energy into mechanical energy
 - d) None of the above
- A draft tube is not required for a ____ 6)
 - a) Francis turbine b) Kaplan turbine
 - c) Pelton wheel turbine d) None of the above
- 7) Multi stage centrifugal pumps are used to _
 - a) Give high discharge produce high heads b) c) Pump viscous fluids
 - All the above d)

Set R The monometric efficiency (η_{man}) of a centrifugal pump is given by _____. H_m $g.H_m$ a) b) $\overline{g.Vw_2.u_2}$ $Vw_2.u_2$ $Vw_2.u_2$ $g.Vw_2.u_2$ d) C) H_m $g.H_m$ Distorted models are required to be prepared for which of the following? a) River Dams across very wide rivers b) c) Harbours d) All of above The specific speed for a turbine has the dimension of 10) a) T^{-1} Dimensionless b) c) $F^{1/2} L^{-3/4} I^{-3/2}$ d) $F^{1/2} L^{-5/2} I^{-3/2}$ 11) The channel whose boundary is not deformable is known as _____ a) Rigid channel b) Prismatic channel c) Mobile channel d) Boundary channel 12) In open channel the specific energy is _ a) The total energy per unit discharge b) The total energy measured above a horizontal datum The total energy measured with respect to the channel bottom C)

d) The Kinetic energy plotted above the free surface

Mannings and chezy's formule are valid for 13)

- Steady uniform flow Steady flow b)
- Steady non-uniform flow d) Unsteady uniform flow
- When bottom slope is greater than critical slope the channel slope is 14) termed as
 - a) Horizantal
 - c) Critical

a)

C)

b) Mild d) Steep

SLR-FM-629

- 8)
- 9)

Page 11 of 16

SLR-FM-629

Seat	
No.	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM Max. Marks: 56

Instructions: 1) Q.2 and Q.6 are compulsory.

2) Answer any two questions from each section.

3) Use of non-programmable calculator is permitted.

- 4) Neat diagram be drawn wherever required.
- 5) Assume any other data if necessary.

Section – I

Q.2	a) b) c)	Explain the significance of channels of most efficient section. Derive the expression for loss of energy though hydraulic jump. Enlist the advantages of triangular notch over rectangular notch.	03 04 03
Q.3	a)	Derive on expression for the discharge thought a channel by chezy's	03
	b)	A rectangular channel 7.5m wide carries $12m^3$ of water per second with a velocity of 1.5 m/sec. Compute the specific energy. Also find the depth of flow in the channel when the specific energy would be minimum. What will be the value of critical velocity as well as minimum specific energy?	06
Q.4	a)	Show that $\frac{y_2}{y_1} = \frac{1}{2} [\sqrt{1 + 8F_r^2} - 1]$	05
	b)	for a hydraulic jump in a rectangular channel (with figure). In a rectangular channel a discharge of 2m ³ /sec per meter width flows with Froudes no.5.0. If the hydraulic jump takes place. Calculate the energy loss per meter width of channel, due to jump.	04
Q.5	a)	Derive the expression for time required to empty the tank by rectangular notch	04
	b)	A cipolletti weir of crest length 80 cm discharges water. The head of water over the weir is 420 mm. Find the discharge over the weir if the channel is 100 cm wide and 70 cm deep. Take $C_d = 0.60$	05
		Section – II	
Q.6	a) b)	Classify water turbines in detail. What is a primary of centrifugal pump?	03 03
	C)	Distinguish between distorted models and undistorted models.	04

Q.7 a) Explain the terms, Net head, Gross head, efficiency of turbine and draft- **04** tube.

Set R

Page 12 of 16

- b) A jet of water 75 mm diameter and with velocity of 20m/ sec flows tangentially on to a stationary vane which deflects the water through 120. What is the magnitude and direction of the resultant force on the vane? If the jet flows on to a series of vanes moving in the direction of the jet with velocity 12 m/sec. Find
 - The force on the system of vanes in the direction of motion. 1)
 - 2) The work done per second
 - 3) The efficiency
- Define the terms-Q.8 a)
 - 1) Suction head
 - 2) **Delivery head**
 - 3) Static head
 - 4) Manometric head
 - b) The outer diameter of an impeller of a centrifugal pump is 500 mm and 05 outlet width is 50 mm. The pump is running at 1000 r.p.m. against head 12m. The vanes angle at outlet is 35° and monometric efficiency is 80% determine.
 - Velocity of flow at outlet 1)
 - 2) Velocity of water leaving the vane and
 - Angle made by the absolute velocity at outlet with the direction motion 3) at outlet and
 - 4) Discharge
- Q.9 The frictional torque T of a disc of diameter D rotating at a speed N in a a) fluid of viscosity M and density ρ in a turbulent. Flow is given by

$$T = D^5 N^2 \varrho \phi \left[\frac{M}{D^2 N \varrho}\right]$$

Use Buckingham π theoram.

Find the form of the equation for discharge 'Q through a sharp- edged 05 b) triangular notch assuming Q depends on the central angle \propto of the notch, head H, gravitational acceleration 'g' and on the density ρ , viscosity μ and surface tension ' σ ' of the fluid.

05

04

Set

SLR-FM-629

SLR-FM-629 Set S

Max. Marks: 70

Marks: 14

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of non-programmable calculator is permitted.
- 3) Assume any other data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) A draft tube is not required for a _____.
 - a) Francis turbineb) Kaplan turbinec) Pelton wheel turbined) None of the above
- 2) Multi stage centrifugal pumps are used to
 - a) Give high discharge
 - c) Pump viscous fluids d)
- 3) The monometric efficiency (η_{man}) of a centrifugal pump is given by _____.

b)

- a) $\frac{H_m}{g.Vw_2.u_2}$ c) $\frac{Vw_2.u_2}{g.H_m}$ b) $\frac{g.H_m}{Vw_2.u_2}$ d) $\frac{g.Vw_2.u_2}{H_m}$
- 4) Distorted models are required to be prepared for which of the following?a) River
 - b) Dams across very wide rivers
 - c) Harbours

a)

d) All of above

5) The specific speed for a turbine has the dimension of _____.

- a) T^{-1} c) $F^{1/2} L^{-3/4} I^{-3/2}$
- b) Dimensionless

produce high heads

All the above

d) $F^{1/2} L^{-5/2} I^{-3/2}$

6) The channel whose boundary is not deformable is known as ____

- a) Rigid channel b) Prismatic channel
- c) Mobile channel d) Boundary channel
- 7) In open channel the specific energy is _____
 - a) The total energy per unit discharge
 - b) The total energy measured above a horizontal datum
 - c) The total energy measured with respect to the channel bottom
 - d) The Kinetic energy plotted above the free surface
- 8) Mannings and chezy's formule are valid for _
 - Steady flow b) Steady uniform flow
 - c) Steady non-uniform flow d) Unsteady uniform flow

Set 9) When bottom slope is greater than critical slope the channel slope is termed as a) Horizantal Mild b) d) c) Critical Steep 10) The article depth meter is used to measure _____. Velocity of flow in an open channel a) b) Depth of flow in an open channel c) Hydraulic Jump d) Depth of channel 11) The side slope of cipolletti weir is generally kept _____. a) 1 to 3 1:5 b) c) 1 to 4 d) 1 to 2 12) The ratio of the percentage error in the discharge and percentage error in the measurements of head over a triangular notch is _____. 2/3 b) 2/5 a) c) 5/2 d) 3/2 13) The force exerted by a jet impinging normally on a fixed plate is _____ ϱav a) b) oav 4 <u></u>eav² d) $\rho a v^2$ c) 4 14) A Turbine is a device which convert _____ ___. Kinetic energy into mechanical energy a) Mechanical energy into hydraulic energy b)

- c) Hydraulic energy into mechanical energy
- d) None of the above

SLR-FM-629

Set S

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering FLUID MECHANICS – II

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q.2 and Q.6 are compulsory.

- 2) Answer any two questions from each section.
- 3) Use of non- programmable calculator is permitted.
- 4) Neat diagram be drawn wherever required.
- 5) Assume any other data if necessary.

Section – I

Q.2	a)	Explain the significance of channels of most efficient section.	03
	b)	Derive the expression for loss of energy though hydraulic jump.	04
	c)	Enlist the advantages of triangular notch over rectangular notch.	03
Q.3	a)	Derive on expression for the discharge thought a channel by chezy's formula.	03
	b)	A rectangular channel 7.5m wide carries 12m ³ of water per second with a velocity of 1.5 m/sec. Compute the specific energy. Also find the depth of flow in the channel when the specific energy would be minimum. What will be the value of critical velocity as well as minimum specific energy?	06
Q.4	a)	Show that $\frac{y_2}{y_1} = \frac{1}{2} \left[\sqrt{1 + 8F_r^2} - 1 \right]$	05
	b)	for a hydraulic jump in a rectangular channel (with figure). In a rectangular channel a discharge of 2m ³ /sec per meter width flows with Froudes no.5.0. If the hydraulic jump takes place. Calculate the energy loss per meter width of channel, due to jump.	04
Q.5	a)	Derive the expression for time required to empty the tank by rectangular notch.	04
	b)	A cipolletti weir of crest length 80 cm discharges water. The head of water over the weir is 420 mm. Find the discharge over the weir if the channel is 100 cm wide and 70 cm deep. Take $C_d = 0.60$	05
		Section – II	
Q.6	a)	Classify water turbines in detail.	03
	b)	What is a primary of centrifugal pump?	03
	C)	Distinguish between distorted models and undistorted models.	04

Q.7 a) Explain the terms, Net head, Gross head, efficiency of turbine and draft- **04** tube.

Max. Marks: 56



04

- 05
- 12m. The vanes angle at outlet is 35° and monometric efficiency is 80% determine.

The work done per second

1) Velocity of flow at outlet

velocity 12 m/sec. Find

The efficiency

Suction head

Delivery head Static head

Manometric head

Define the terms-

- 2) Velocity of water leaving the vane and
- 3) Angle made by the absolute velocity at outlet with the direction motion at outlet and

The outer diameter of an impeller of a centrifugal pump is 500 mm and

outlet width is 50 mm. The pump is running at 1000 r.p.m. against head

Discharge 4)

b)

Q.8

a)

b)

1)

2)

3)

1)

2)

3)

4)

Q.9 The frictional torque T of a disc of diameter D rotating at a speed N in a 04 a) fluid of viscosity M and density ρ in a turbulent. Flow is given by

$$T = D^5 N^2 \varrho \phi \left[\frac{M}{D^2 N \varrho} \right]$$

Use Buckingham π theoram.

Find the form of the equation for discharge 'Q through a sharp- edged 05 b) triangular notch assuming Q depends on the central angle \propto of the notch, head H, gravitational acceleration 'g' and on the density ρ , viscosity μ and surface tension ' σ ' of the fluid.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

SLR-FM-63

Instru	uctio	ons:	 Q. No. 1 is compulsory and should be solved in first 30 minutes in answ book 	ver
			 2) Figures to the right indicate full marks. 3) Non programmable calculator is allowed. 4) Assume suitable data if required and state it clearly. 	
			MCQ/Objective Type Questions	
Durat	Duration: 30 Minutes Marks:			14
Q.1	Cho 1)	bose In ca a) b) c) d)	the correct alternatives from the options and rewrite the sentence. ase of over reinforced section which element fails first Both steel and concrete simultaneously Neither steel or concrete Steel Concrete	14 01
	2)	The a) c)	shear failure can be due toShear-tensionb)Shear-bondOver reinforced sectiond)All of these	01
	3)	Acco not e a) b) c) d)	ording to IS 456:2000, the maximum diameter of reinforcing bars shall exceed One-fourth of the total thickness of the slab One-sixth o f the total thickness of the slab One-eighth of the total thickness of the slab One-tenth of the total thickness of the slab	01
	4)	For a prov on _ a) c)	a shear force, Vus for which vertical shear reinforcement is to be rided, the ratio of Vus and effective depth (d) of beam is dependent 	01
	5)	The mm. The state a) c)	rectangular beam of width, 250 mm is having effective depth of 327 The concrete grade is M ₂₀ and the grade of reinforcing steel is Fe ₄₁₅ . tensile reinforcement is provided by 2-16 mm dia bars. As per limit e method, the moment of resistance due to steel is equal to 21.315 kNm b) 31.973 kNm 42.550 kNm d) 53.288 kNm	02
	6)	In a a) b) c)	two way restrained slab, the width of each edge strip is considered as One-eighth of the width of the slab One-quarter of the width of the slab Half of the width of the slab	01

Seat No.

Day & Date: Saturday, 07-12-2019

Time: 02:30 PM To 05:30 PM

d)

Three-quarter of the width of the slab

Max. Marks: 70

Set P

	SLR-FM-	63
	Set	Ρ
7)	 Torsion reinforcement shall be provided a) At the middle-strip of the slab b) At edge-strips of the slab c) At any corner where the slab is simply supported on both edges meeting at that comer d) At any comer where the slab is continuous on both edges meeting at that corner 	01
8)	For a rectangular column of size 400mm×450mm, the value of p/fck is taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M_{20} and the grade of steel is Fe ₄₁₅ . The area of steel will be equal to a) 4500.0mm ² b) 2700.0mm ² c) 3600.0mm ² d) 1800.0mm ²	02
9)	A flanged beam is having the following dimension: width of flange, bf = 1000mm depth of flange, Df = 125mm, width of web, bw = 250mm and overall depth of beam, D = 250 mm The concrete grade is M_{20} and the grade of reinforcing steel is Fe ₁₄₅ . The clear cover is 25mm. The area of steel required in balanced condition is equal to a) 1029 mm ² b) 2572 mm ² c) 2058 mm ² d) None of the above	02
10)	A square column with 5.0m unsupported length, restrained in its position and direction at both ends. It carries a design axial load of 1200kN. What would be the dimension of the column (to the nearest multiple of 5)? Assume concrete grade M20, steel grade Fe415, area of steel 1.0% of its gross cross-sectional area and it is perfectly axially loaded. a) 310mm × 310mm b) 335mm × 335mm c) 360mm × 360mm d) 385mm × 385mm	02

Seat B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019

Time: 02:30 PM To 05:30 PM

No.

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from each section.
- 2) Use of IS 456:2000 original and non programmable calculator is allowed.
- 3) Figure to the right indicates full marks.
- 4) Assume additional suitable data if necessary and state it clearly.
- 5) Draw neat sketch of reinforcement details.

Section – I

- Q.2 A beam 250 mm x 550 mm effective is subjected to a factored moment of 300 **08** kNm. Determine the area of steel required. Use M₂₀ concrete and Fe₄₁₅ steel. Assume d' = 50mm.
- Design the edge beam for the slab beam system as shown in Fig. No. 1. Q.3 10 Clear span of beams are 7m. Live load on the beam is 4kN/m². Use M₂₀ concrete and Fe₅₀₀ steel.



- Design a simply supported roof slab for a room 7.5m x 3.5m clear size. The slab 10 Q.4 is carrying an imposed load of 4kN/m². Use M₂₀ concrete and Fe₄₁₅ steel.
- A rectangular reinforced concrete beam is simply supported on two masonry Q.5 10 walls 230mm thick and 6m apart. The beam is carrying an imposed load of 15 kN/m. Design the beam. Use M₂₅ concrete and Fe₄₁₅ steel.

Section – II

- Q.6 Design the reinforcement for a short axially loaded square column of size 420 **08** mm x 420 mm to support a load of 1000 kN. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.7 Design a rectangular beam, continuous over four column supports with effective 10 span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M₂₅ concrete and Fe₅₀₀ steel.
- **Q.8** Determine reinforcement required for a beam size 300 mm x 600 mm subjected 10 to factored bending moment of 150 kNm, factored shear force 100 kN and factored torsional moment of 50 kNm. Use M₂₀ concrete and Fe₅₀₀ steel.

Max. Marks: 56

SLR-FM-63

Set



Set P

- Q.9 a) Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M₂₅ concrete and Fe₄₁₅ steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation.
 - b) Write an "Interaction diagrams" for column stating their salient features. **03**
| Seat | |
|------|--|
| No. | |

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF CONCRETE STRUCTURES – I**

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) In a two way restrained slab, the width of each edge strip is considered as 01
 - a) One-eighth of the width of the slab
 - One-quarter of the width of the slab b)
 - Half of the width of the slab C)
 - d) Three-quarter of the width of the slab
 - 2) Torsion reinforcement shall be provided _____.
 - a) At the middle-strip of the slab
 - b) At edge-strips of the slab
 - c) At any corner where the slab is simply supported on both edges meeting at that comer
 - At any comer where the slab is continuous on both edges meeting at d) that corner
 - 3) For a rectangular column of size 400mm×450mm, the value of p/fck is 02 taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M_{20} and the grade of steel is Fe_{415} . The area of steel will be equal to _____.
 - b) 2700.0mm² 4500.0mm² a)
 - d) 1800.0 mm² c) 3600.0mm²
 - 4) A flanged beam is having the following dimension: width of flange, bf =02 1000mm depth of flange, Df = 125mm, width of web, bw = 250mm and overall depth of beam, D = 250 mm The concrete grade is M_{20} and the grade of reinforcing steel is Fe₁₄₅. The clear cover is 25mm. The area of steel required in balanced condition is equal to
 - b) 2572 mm^2 1029 mm^2 a)
 - 2058 mm² d) None of the above c)
 - 5) A square column with 5.0m unsupported length, restrained in its position 02 and direction at both ends. It carries a design axial load of 1200kN. What would be the dimension of the column (to the nearest multiple of 5)? Assume concrete grade M20, steel grade Fe415, area of steel 1.0% of its gross cross-sectional area and it is perfectly axially loaded.
 - b) 335mm × 335mm a) 310mm × 310mm
 - c) 360mm × 360mm d) 385mm × 385mm

Max. Marks: 70

01

Marks: 14

	SLR-FM-	·63
	Set	Q
6)	 In case of over reinforced section which element fails first a) Both steel and concrete simultaneously b) Neither steel or concrete c) Steel d) Concrete 	01
7)	The shear failure can be due toa) Shear-tensionb) Shear-bondc) Over reinforced sectiond) All of these	01
8)	 According to IS 456:2000, the maximum diameter of reinforcing bars shall not exceed a) One-fourth of the total thickness of the slab b) One-sixth of the total thickness of the slab c) One-eighth of the total thickness of the slab d) One-tenth of the total thickness of the slab 	01
9)	For a shear force, Vus for which vertical shear reinforcement is to be provided, the ratio of Vus and effective depth (d) of beam is dependent ona) Shear reinforcement c) Grade of steelb) Spacing of shear reinforcement d) All of these	01
10)	The rectangular beam of width, 250 mm is having effective depth of 327 mm. The concrete grade is M_{20} and the grade of reinforcing steel is Fe_{415} . The tensile reinforcement is provided by 2-16 mm dia bars. As per limit state method, the moment of resistance due to steel is equal to	02

- a) 21.315 kNm c) 42.550 kNm
- b) 31.973 kNm d) 53.288 kNm

Seat No. B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019

Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from each section.
- 2) Use of IS 456:2000 original and non programmable calculator is allowed.
- 3) Figure to the right indicates full marks.
- 4) Assume additional suitable data if necessary and state it clearly.
- 5) Draw neat sketch of reinforcement details.

Section – I

- Q.2 A beam 250 mm x 550 mm effective is subjected to a factored moment of 300 kNm. Determine the area of steel required. Use M₂₀ concrete and Fe₄₁₅ steel. Assume d' = 50mm.
- Q.3 Design the edge beam for the slab beam system as shown in Fig. No. 1.
 Clear span of beams are 7m. Live load on the beam is 4kN/m². Use M₂₀ concrete and Fe₅₀₀ steel.



- **Q.4** Design a simply supported roof slab for a room 7.5m x 3.5m clear size. The slab **10** is carrying an imposed load of $4kN/m^2$. Use M₂₀ concrete and Fe₄₁₅ steel.
- Q.5 A rectangular reinforced concrete beam is simply supported on two masonry walls 230mm thick and 6m apart. The beam is carrying an imposed load of 15 kN/m. Design the beam. Use M₂₅ concrete and Fe₄₁₅ steel.

Section – II

- Q.6 Design the reinforcement for a short axially loaded square column of size 420 mm x 420 mm to support a load of 1000 kN. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.7 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.8 Determine reinforcement required for a beam size 300 mm x 600 mm subjected 10 to factored bending moment of 150 kNm, factored shear force 100 kN and factored torsional moment of 50 kNm. Use M₂₀ concrete and Fe₅₀₀ steel.

Max. Marks: 56

SLR-FM-63



Set Q

- Q.9 a) Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M₂₅ concrete and Fe₄₁₅ steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation.
 - b) Write an "Interaction diagrams" for column stating their salient features. **03**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

DESIGN OF CONCRETE STRUCTURES – I

- 2) Figures to the right indicate full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 02

- A flanged beam is having the following dimension: width of flange, bf = 1) 1000mm depth of flange, Df = 125mm, width of web, bw = 250mm and overall depth of beam, D = 250 mm The concrete grade is M_{20} and the grade of reinforcing steel is Fe₁₄₅. The clear cover is 25mm. The area of steel required in balanced condition is equal to _____ a) 1029 mm² b) 2572 mm²

 - 2058 mm^2 c) d) None of the above
- 2) A square column with 5.0m unsupported length, restrained in its position 02 and direction at both ends. It carries a design axial load of 1200kN. What would be the dimension of the column (to the nearest multiple of 5)? Assume concrete grade M20, steel grade Fe415, area of steel 1.0% of its gross cross-sectional area and it is perfectly axially loaded.
 - b) 335mm x 335mm 310mm × 310mm a)
 - c) 360mm × 360mm d) 385mm × 385mm
- In case of over reinforced section which element fails first 3) 01 a) Both steel and concrete simultaneously
 - Neither steel or concrete b)
 - c) Steel
 - d) Concrete

The shear failure can be due to 4) 01 a) Shear-tension Shear-bond b)

- Over reinforced section d) All of these c)
- According to IS 456:2000, the maximum diameter of reinforcing bars shall 01 5) not exceed
 - a) One-fourth of the total thickness of the slab
 - One-sixth of the total thickness of the slab b)
 - c) One-eighth of the total thickness of the slab
 - One-tenth of the total thickness of the slab d)



Max. Marks: 70

Marks: 14

	SLR-FM-	63
	Set	R
6)	 For a shear force, Vus for which vertical shear reinforcement is to be provided, the ratio of Vus and effective depth (d) of beam is dependent on a) Shear reinforcement b) Spacing of shear reinforcement c) Grade of steel d) All of these 	01
7)	The rectangular beam of width, 250 mm is having effective depth of 327 mm. The concrete grade is M_{20} and the grade of reinforcing steel is Fe_{415} . The tensile reinforcement is provided by 2-16 mm dia bars. As per limit state method, the moment of resistance due to steel is equal to a) 21.315 kNm b) 31.973 kNm c) 42.550 kNm d) 53.288 kNm	02
8)	In a two way restrained slab, the width of each edge strip is considered as a) One-eighth of the width of the slab b) One-quarter of the width of the slab c) Half of the width of the slab	01
9)	 d) Three-quarter of the width of the slab Torsion reinforcement shall be provided a) At the middle-strip of the slab b) At edge-strips of the slab c) At any corner where the slab is simply supported on both edges meeting at that comer d) At any comer where the slab is continuous on both edges meeting at that corner 	01
10)	For a rectangular column of size 400mm×450mm, the value of p/fck is taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M_{20} and the grade of steel is Fe_{415} . The area of steel will be equal to	02

- b) 2700.0mm² d) 1800.0mm² a) 4500.0mm² c) 3600.0mm²

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from each section.
- 2) Use of IS 456:2000 original and non programmable calculator is allowed.
- 3) Figure to the right indicates full marks.
- 4) Assume additional suitable data if necessary and state it clearly.
- 5) Draw neat sketch of reinforcement details.

Section – I

- Q.2 A beam 250 mm x 550 mm effective is subjected to a factored moment of 300 kNm. Determine the area of steel required. Use M₂₀ concrete and Fe₄₁₅ steel. Assume d' = 50mm.
- Q.3 Design the edge beam for the slab beam system as shown in Fig. No. 1.
 Clear span of beams are 7m. Live load on the beam is 4kN/m². Use M₂₀ concrete and Fe₅₀₀ steel.



- **Q.4** Design a simply supported roof slab for a room 7.5m x 3.5m clear size. The slab **10** is carrying an imposed load of $4kN/m^2$. Use M_{20} concrete and Fe₄₁₅ steel.
- Q.5 A rectangular reinforced concrete beam is simply supported on two masonry walls 230mm thick and 6m apart. The beam is carrying an imposed load of 15 kN/m. Design the beam. Use M₂₅ concrete and Fe₄₁₅ steel.

Section – II

- Q.6 Design the reinforcement for a short axially loaded square column of size 420 mm x 420 mm to support a load of 1000 kN. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.7 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.8 Determine reinforcement required for a beam size 300 mm x 600 mm subjected 10 to factored bending moment of 150 kNm, factored shear force 100 kN and factored torsional moment of 50 kNm. Use M₂₀ concrete and Fe₅₀₀ steel.

Max. Marks: 56

SLR-FM-63



Set R

- Design a circular column of diameter 400 mm with helical reinforcement **Q.9** a) 07 subjected to a load of 1200 kN. Use M₂₅ concrete and Fe₄₁₅ steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. 03
 - b) Write an "Interaction diagrams" for column stating their salient features.

01

SLR-FM-63

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) According to IS 456:2000, the maximum diameter of reinforcing bars shall 01 not exceed _____.
 - a) One-fourth of the total thickness of the slab
 - b) One-sixth of the total thickness of the slab
 - c) One-eighth of the total thickness of the slab
 - d) One-tenth of the total thickness of the slab
- For a shear force, Vus for which vertical shear reinforcement is to be provided, the ratio of Vus and effective depth (d) of beam is dependent on _____.
 - a) Shear reinforcement

Grade of steel

C)

- b) Spacing of shear reinforcementd) All of these
- The rectangular beam of width, 250 mm is having effective depth of 327 02 mm. The concrete grade is M₂₀ and the grade of reinforcing steel is Fe₄₁₅. The tensile reinforcement is provided by 2-16 mm dia bars. As per limit state method, the moment of resistance due to steel is equal to _____.
 - a) 21.315 kNm b) 31.973 kNm
 - c) 42.550 kNm d) 53.288 kNm

4) In a two way restrained slab, the width of each edge strip is considered as 01

- a) One-eighth of the width of the slab
- b) One-quarter of the width of the slab
- c) Half of the width of the slab
- d) Three-quarter of the width of the slab

5) Torsion reinforcement shall be provided _____.

- a) At the middle-strip of the slab
- b) At edge-strips of the slab
- c) At any corner where the slab is simply supported on both edges meeting at that comer
- d) At any comer where the slab is continuous on both edges meeting at that corner

9

Marks: 14

Max. Marks: 70

	SLR-FM-	63
	Set	S
6)	For a rectangular column of size 400mm×450mm, the value of p/fck is taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M_{20} and the grade of steel is Fe_{415} . The area of steel will be equal to a) 4500.0mm ² b) 2700.0mm ² c) 3600.0mm ² d) 1800.0mm ²	02
7)	A flanged beam is having the following dimension: width of flange, bf = 1000mm depth of flange, Df = 125mm, width of web, bw = 250mm and overall depth of beam, D = 250 mm The concrete grade is M_{20} and the grade of reinforcing steel is Fe ₁₄₅ . The clear cover is 25mm. The area of steel required in balanced condition is equal to a) 1029 mm ² b) 2572 mm ² c) 2058 mm ² d) None of the above	02
8)	A square column with 5.0m unsupported length, restrained in its position and direction at both ends. It carries a design axial load of 1200kN. What would be the dimension of the column (to the nearest multiple of 5)? Assume concrete grade M20, steel grade Fe415, area of steel 1.0% of its gross cross-sectional area and it is perfectly axially loaded. a) 310mm × 310mm b) 335mm × 335mm c) 360mm × 360mm d) 385mm × 385mm	02
9)	 In case of over reinforced section which element fails first a) Both steel and concrete simultaneously b) Neither steel or concrete c) Steel d) Concrete 	01
10)	The shear failure can be due toa) Shear-tensionb) Shear-bondc) Over reinforced sectiond) All of these	01

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Question No. 2 and 6 are compulsory.

- 2) Solve any two questions from each section.
- 2) Use of IS 456:2000 original and non programmable calculator is allowed.
- 3) Figure to the right indicates full marks.
- 4) Assume additional suitable data if necessary and state it clearly.
- 5) Draw neat sketch of reinforcement details.

Section – I

- Q.2 A beam 250 mm x 550 mm effective is subjected to a factored moment of 300 kNm. Determine the area of steel required. Use M₂₀ concrete and Fe₄₁₅ steel. Assume d' = 50mm.
- Q.3 Design the edge beam for the slab beam system as shown in Fig. No. 1.
 Clear span of beams are 7m. Live load on the beam is 4kN/m². Use M₂₀ concrete and Fe₅₀₀ steel.



- **Q.4** Design a simply supported roof slab for a room 7.5m x 3.5m clear size. The slab **10** is carrying an imposed load of $4kN/m^2$. Use M₂₀ concrete and Fe₄₁₅ steel.
- Q.5 A rectangular reinforced concrete beam is simply supported on two masonry walls 230mm thick and 6m apart. The beam is carrying an imposed load of 15 kN/m. Design the beam. Use M₂₅ concrete and Fe₄₁₅ steel.

Section – II

- Q.6 Design the reinforcement for a short axially loaded square column of size 420 mm x 420 mm to support a load of 1000 kN. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.7 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.8 Determine reinforcement required for a beam size 300 mm x 600 mm subjected 10 to factored bending moment of 150 kNm, factored shear force 100 kN and factored torsional moment of 50 kNm. Use M₂₀ concrete and Fe₅₀₀ steel.

Max. Marks: 56

vea.

SLR-FM-63

Set S

Set S

- Q.9 a) Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M₂₅ concrete and Fe₄₁₅ steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation.
 - b) Write an "Interaction diagrams" for column stating their salient features. **03**

Seat No.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Rainfall mass cure is variation of 1)
 - Rainfall intensity with time a)
 - b) Rainfall intensity with cumulative rainfall
 - c) Rainfall excess with time
 - d) Cumulative rainfall with time
- 2) Flow duration cure is plot of
 - a) Accumulated flow against time
 - Discharge against time in chronological order b)
 - c) The base flow against the percentage of times the flow exceeded
 - The stream discharge against the percentage of times the flow is d) equaled or exceeded
- 3) Which of the following formations neither contains water nor transmits it?
 - a) Aquiclude b) Aquifer
 - c) Aquifuge Aquitard d)
- If e_w and e_a are the saturated vapour pressure of the water surface and 4) air respectively, the Daltons law for evaporation EL in unit time is given by EL=
 - $(e_w e_a)$ a) b)
 - K e_we_a c) K ($e_w - e_a$) d) $K(e_w + e_a)$
- 5) Interception losses
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- The percentage of total quantity of fresh water in the world available in 6) the liquid form _____.
 - a) 30% 70% b)
 - c) 11 % d) 51%

SLR-FM-630



Set

Max. Marks: 70

Marks: 14



S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Distance

Velocity at

(m) Depth

(m)

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7, and 9 from section II

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section – I

- A) Briefly discuss the factors affecting evaporation. What are the methods Q.2 05 used to control evaporation from reservoir.
 - A precipitation station 'X' was inoperative for some time during which a B) 04 storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X. A. B. & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- Q.3 What is meant by runoff? Explain methods of separation of base flow. A)
 - The ordinates of 3-hr unit hydrograph are given as below. Using this data B) derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

6

1.8

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

8

2.4

10

2.6

12

2.0

14

1.8

16

1.6

18

1.0

20

0

What is flood and discuss the various factors affecting flood? Q.4 A) B) Estimate the stream flow for the measurement data as given.

4

1.2

2

0.5

0

0

0 0.3 0.4 0.6 0.9 1.2 0.9 0.7 0.5 0.3 0 0.2d (m/s) Velocity at 0.4 0 0.2 0.35 0.45 0.4 0.3 0.4 0.5 0.2 0 0.8d (m/s) Q.5 A) Enlist, classify and discuss in brief geological formation where round water 05 occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The 04 strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Set Ρ

> 05 05

> > 04

05

Max. Marks: 56

Seat No.

Set P

05

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05
 - i) Field capacity of soil = 30%
 - ii) Permanent Wilting point = 11%
 - iii) Density of soil = 1300 kg/m^3
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop				
Сюр	Dase period (days)	(ha/cumec)	(ha)				
Wheat	120	1800	4800				
Sugarcane	360	800	5600				
Cotton	200	1400	2400				
Rice	120	900	3200				
Vegetables	120	700	1400				

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The most economical method of soil conservation is to 1)
 - b) construct contour bunds
 - a) construct check dams c) Drain the soil
- 2) Consumptive use of water for a crop represents _____.
 - Transpiration needs of the crop a)
 - b) Evaporation needs of the cropped area
 - c) Evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism.
 - d) None of the above
- 3) The method of growing crops on ridges, running on the sides of water ditches is known as .
 - a) Flood irrigation
 - b) **Furrow irrigation** d) None of them c) Check irrigation
- 4) If the depth is 8.64cm on a field over a base period of 10 days, then the dutv is .
 - a) 10 ha/cumec b) 100 ha/cumec
 - c) 864 ha/cumec d) 1000 ha/cumec
- 5) Irrigation potential of the country is about _____
 - a) 87 Mha 100 Mha b)
 - c) 113 Mha d) 125 Mha
- 6) Lift irrigation is flow .
 - a) by gravity
 - c) in delta region through sprinkler heads d)
- The best method of applying water to sandy undulating area is _____. 7)
 - a) Free flooding c) Subsurface irrigation
- Furrow method b) Sprinkler irrigation

from lower level to higher level

d)

b)

- Rainfall mass cure is variation of 8)
 - a) Rainfall intensity with time
 - b) Rainfall intensity with cumulative rainfall
 - Rainfall excess with time c)
 - d) Cumulative rainfall with time

Set

Q

Max. Marks: 70

- d) Aforest the soil



Seat No.

Duration: 30 Minutes

Marks: 14

- 9) Flow duration cure is plot of _____
 - a) Accumulated flow against time
 - b) Discharge against time in chronological order
 - c) The base flow against the percentage of times the flow exceeded
 - d) The stream discharge against the percentage of times the flow is equaled or exceeded
- 10) Which of the following formations neither contains water nor transmits it?
 - a) Aquiclude b) Aquifer
 - c) Aquifuge d) Aquitard
- If e_w and e_a are the saturated vapour pressure of the water surface and air respectively, the Daltons law for evaporation EL in unit time is given by EL= _____.

b)

K e_we_a

- a) (e_w e_a)
- c) K $(e_w e_a)$ d) K $(e_w + e_a)$
- 12) Interception losses _____
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- 13) The percentage of total quantity of fresh water in the world available in the liquid form _____.
 - a) 30% b) 70%
 - c) 11 % d) 51%
- 14) The dilution method of stream gauging is ideally suited for measuring discharge in _____.
 - a) A large alluvial rivers
 - b) Flood flow in mountain stream
 - c) Steady flow in a small turbulent stream
 - d) A stretch of river having heavy industrial pollution load

SLR-FM-630

Set

Seat No.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7,and 9 from section II

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section – I

- Q.2 A) Briefly discuss the factors affecting evaporation. What are the methods 05 used to control evaporation from reservoir.
 - B) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X, A, B, & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- **Q.3** A) What is meant by runoff? Explain methods of separation of base flow.
 - B) The ordinates of 3-hr unit hydrograph are given as below. Using this data derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

Q.4 A) What is flood and discuss the various factors affecting flood?B) Estimate the stream flow for the measurement data as given.

Distance (m)	0	2	4	6	8	10	12	14	16	18	20
Depth (m)	0	0.5	1.2	1.8	2.4	2.6	2.0	1.8	1.6	1.0	0
Velocity at 0.2d (m/s)	0	0.3	0.4	0.6	0.9	1.2	0.9	0.7	0.5	0.3	0
Velocity at 0.8d (m/s)	0	0.2	0.3	0.35	0.4	0.45	0.4	0.5	0.4	0.2	0

Q.5 A) Enlist, classify and discuss in brief geological formation where round water **05** occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Set Q

Max. Marks: 56

05 05

Set

05

05

Section – II

Q.6	A)	Write a detailed note on "National Perspective Plan" of National Water	04
	-	Development Academy for inter-basin transfer of water in India.	
	B)	The following data pertains to the healthy growth of a crop.	05
		i) Field capacity of soil = 30%	
		ii) Permanent Wilting point = 11%	
		iii) Density of soil = 1300 kg/m^3	
		iv) Effective depth of root zone = 700mm	
		v) Daily consumptive use of water = 12mm	
		For healthy growth, moisture content must not fall below 25% of the water	
		holding capacity and the permanent wilting point. Determine the watering	

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop			
Сюр	Dase period (days)	(ha/cumec)	(ha)			
Wheat	120	1800	4800			
Sugarcane	360	800	5600			
Cotton	200	1400	2400			
Rice	120	900	3200			
Vegetables	120	700	1400			

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

WATER RESOURCES ENGINEERING – I

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Interception losses ____
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- 2) The percentage of total quantity of fresh water in the world available in the liquid form _____.
 - a) 30% b) 70%
 - c) 11 % d) 51%
- 3) The dilution method of stream gauging is ideally suited for measuring discharge in _____.
 - a) A large alluvial rivers
 - b) Flood flow in mountain stream
 - c) Steady flow in a small turbulent stream
 - d) A stretch of river having heavy industrial pollution load
- 4) The most economical method of soil conservation is to _____
 - a) construct check dams b) construct contour bunds
 - c) Drain the soil d) Aforest the soil
- 5) Consumptive use of water for a crop represents _____.
 - a) Transpiration needs of the crop
 - b) Evaporation needs of the cropped area
 - c) Evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism.
 - d) None of the above
- 6) The method of growing crops on ridges, running on the sides of water ditches is known as _____.
 - a) Flood irrigation b) Furrow irrigation
 - c) Check irrigation d) None of them
- 7) If the depth is 8.64cm on a field over a base period of 10 days, then the duty is _____.
 - a) 10 ha/cumec
 - c) 864 ha/cumec
- b) 100 ha/cumec
- d) 1000 ha/cumec

Max. Marks: 70

Marks: 14

Set R

Set R

SLR-FM-630

- 8) Irrigation potential of the country is about _____
 - a) 87 Mha
 - c) 113 Mha d) 125 Mha
- 9) Lift irrigation is flow _____.
 - a) by gravity
- b) from lower level to higher level

100 Mha

c) in delta region d) through sprinkler heads

b)

10) The best method of applying water to sandy undulating area is _____.

- a) Free flooding b) Furrow method
- c) Subsurface irrigation d) Sprinkler irrigation
- 11) Rainfall mass cure is variation of _____.
 - a) Rainfall intensity with time
 - b) Rainfall intensity with cumulative rainfall
 - c) Rainfall excess with time
 - d) Cumulative rainfall with time
- 12) Flow duration cure is plot of ____
 - a) Accumulated flow against time
 - b) Discharge against time in chronological order
 - c) The base flow against the percentage of times the flow exceeded
 - d) The stream discharge against the percentage of times the flow is equaled or exceeded
- 13) Which of the following formations neither contains water nor transmits it?
 - a) Aquiclude

- b) Aquifer
- c) Aquifuge d) Aquitard
- 14) If e_w and e_a are the saturated vapour pressure of the water surface and air respectively, the Daltons law for evaporation EL in unit time is given by EL= _____.
 - a) $(\overline{e_w e_a})$
 - c) K (e_w e_a)

- b) K e_we_a
- d) $K(e_w + e_a)$

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Distance

(m)

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7, and 9 from section II

WATER RESOURCES ENGINEERING – I

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section – I

- A) Briefly discuss the factors affecting evaporation. What are the methods Q.2 05 used to control evaporation from reservoir.
 - A precipitation station 'X' was inoperative for some time during which a B) 04 storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X. A. B. & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- Q.3 What is meant by runoff? Explain methods of separation of base flow. A)
 - The ordinates of 3-hr unit hydrograph are given as below. Using this data B) derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

8

10

12

14

16

18

20

What is flood and discuss the various factors affecting flood? Q.4 A) B) Estimate the stream flow for the measurement data as given.

4

2

0

Depth 0 0.5 1.2 1.8 2.4 2.6 2.0 1.8 1.6 1.0 0 (m) Velocity at 0 0.3 0.4 0.6 0.9 1.2 0.9 0.7 0.5 0.3 0 0.2d (m/s) Velocity at 0.4 0 0.2 0.35 0.45 0.4 0.3 0.4 0.5 0.2 0 0.8d (m/s)

6

Q.5 A) Enlist, classify and discuss in brief geological formation where round water 05 occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aguifer. The 04 strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

05 05

04

05

Max. Marks: 56

Set R

Seat No.

Set

05

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05
 - i) Field capacity of soil = 30%
 - ii) Permanent Wilting point = 11%
 - iii) Density of soil = 1300 kg/m^3
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop	
Сюр	Dase period (days)	(ha/cumec)	(ha)	
Wheat	120	1800	4800	
Sugarcane	360	800	5600	
Cotton	200	1400	2400	
Rice	120	900	3200	
Vegetables	120	700	1400	

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

Page **12** of **16**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

WATER RESOURCES ENGINEERING – I

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Instructions: 1) Assume suitable data if necessary but mention it clearly.

- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.
- 4) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The method of growing crops on ridges, running on the sides of water 1)
 - ditches is known as _____.
 - a) Flood irrigation b)
 - c) Check irrigation d)
- 2) If the depth is 8.64cm on a field over a base period of 10 days, then the dutv is
 - a) 10 ha/cumec b)
 - c) 864 ha/cumec d) 1000 ha/cumec
- Irrigation potential of the country is about _ 3)
 - a) 87 Mha b)
 - c) 113 Mha d)
- 4) Lift irrigation is flow _____.
 - a) by gravity
 - c) in delta region d)
- The best method of applying water to sandy undulating area is . 5)
 - a) Free flooding Furrow method b)
 - c) Subsurface irrigation d) Sprinkler irrigation
- Rainfall mass cure is variation of 6)
 - a) Rainfall intensity with time
 - b) Rainfall intensity with cumulative rainfall
 - c) Rainfall excess with time
 - d) Cumulative rainfall with time
- 7) Flow duration cure is plot of _
 - Accumulated flow against time a)
 - Discharge against time in chronological order b)
 - c) The base flow against the percentage of times the flow exceeded
 - d) The stream discharge against the percentage of times the flow is equaled or exceeded
- 8) Which of the following formations neither contains water nor transmits it?
 - Aquiclude Aquifer b) a)
 - Aquifuge c) d) Aquitard

Max. Marks: 70



Set



Seat No.

Duration: 30 Minutes

- Marks: 14
- Furrow irrigation
- None of them
- 100 ha/cumec
- 100 Mha
 - 125 Mha
 - - b) from lower level to higher level
 - through sprinkler heads



- If e_w and e_a are the saturated vapour pressure of the water surface and air respectively, the Daltons law for evaporation EL in unit time is given by EL= _____.
 - a) $(e_w e_a)$ c) K $(e_w - e_a)$

b) $K e_w e_a$ d) $K(e_w + e_a)$

- 10) Interception losses _____
 - a) Includes evaporation through flow and stream flow
 - b) Consists only evaporation loss
 - c) Includes evaporation and transpiration losses
 - d) Consists only stream flow
- 11) The percentage of total quantity of fresh water in the world available in the liquid form _____.
 - a) 30% b) 70%
 - c) 11 % d) 51%
- 12) The dilution method of stream gauging is ideally suited for measuring discharge in _____.
 - a) A large alluvial rivers
 - b) Flood flow in mountain stream
 - c) Steady flow in a small turbulent stream
 - d) A stretch of river having heavy industrial pollution load
- 13) The most economical method of soil conservation is to _
 - a) construct check dams
- b) construct contour bunds
- c) Drain the soil d) Aforest the soil
- 14) Consumptive use of water for a crop represents _____.
 - a) Transpiration needs of the crop
 - b) Evaporation needs of the cropped area
 - c) Evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism.
 - d) None of the above

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 5:30 PM

Seat No.

Instructions: 1) Q. No. 3 and 8 compulsory. Attempt any two question out of Q.No.2,4, and 5 from Section I and Attempt any two question out of Q.No.6,7,and 9 from section II

Civil Engineering WATER RESOURCES ENGINEERING – I

- 2) Assume suitable data wherever necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

Section - I

- Q.2 A) Briefly discuss the factors affecting evaporation. What are the methods 05 used to control evaporation from reservoir.
 - B) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm totals at three stations A, B, C surrounding station 'X' were respectively 6.60, 4.80 & 3.70 cm. The normal annual precipitation amounts at stations X, A, B, & C are 65.60, 72.60, 51.80 & 38.20 cm respectively. Estimate the storm precipitation for station 'X'.
- **Q.3** A) What is meant by runoff? Explain methods of separation of base flow.
 - B) The ordinates of 3-hr unit hydrograph are given as below. Using this data derive the ordinates of 6-hr unit hydrograph for the same basin analytically. What is peak value of discharge in this unit hydrograph?

Time in Hrs	0	3	6	9	12	15	18	21	24	27	30
Ordinates(m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

Q.4 A) What is flood and discuss the various factors affecting flood?B) Estimate the stream flow for the measurement data as given.

Distance (m)	0	2	4	6	8	10	12	14	16	18	20
Depth (m)	0	0.5	1.2	1.8	2.4	2.6	2.0	1.8	1.6	1.0	0
Velocity at 0.2d (m/s)	0	0.3	0.4	0.6	0.9	1.2	0.9	0.7	0.5	0.3	0
Velocity at 0.8d (m/s)	0	0.2	0.3	0.35	0.4	0.45	0.4	0.5	0.4	0.2	0

Q.5 A) Enlist, classify and discuss in brief geological formation where round water **05** occurs.

B) A tube well of 30 cm diameter penetrates fully in an artesion aquifer. The strainer length is 15m. Calculate the yield from the well under a drawdown of 3 m. The aquifer consists of sand of effective size of 0.2 mm having coefficient of permeability equal to 50 m/day. Assume radius of drawdown equal to 150 meters.

Max. Marks: 56

05

05

Set S

05

Section – II

- Q.6 A) Write a detailed note on "National Perspective Plan" of National Water 04 Development Academy for inter-basin transfer of water in India.
 B) The following data pertains to the healthy growth of a crop. 05

 i) Field capacity of soil = 30%
 ii) Permanent Wilting point = 11%
 - iii) Density of soil = 1300 kg/m^3
 - iv) Effective depth of root zone = 700mm
 - v) Daily consumptive use of water = 12mm

For healthy growth, moisture content must not fall below 25% of the water holding capacity and the permanent wilting point. Determine the watering interval in days.

- **Q.7** A) Define the following terms:
 - i) Gross command area
 - ii) Crop period and base period
 - iii) Capacity factor
 - iv) Kor- watering and Kor-depth
 - B) The base period, intensity of irrigation and duty of various crops under a canal irrigation system are given in the following table. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.

Crop	Base period (days)	Duty at field	Area under the crop	
Сюр	Dase period (days)	(ha/cumec)	(ha)	
Wheat	120	1800	4800	
Sugarcane	360	800	5600	
Cotton	200	1400	2400	
Rice	120	900	3200	
Vegetables	120	700	1400	

- **Q.8 A)** Classify Indian soils according to their origin and their suitability for various **04** crops.
 - B) Discuss economic feasibility of Lift irrigation schemes. Compare lift
 06 irrigation and canal irrigation from various aspects.
- **Q.9** A) Write a short note on Kolhapur type Weir
 - B) Discuss various methods of assessment of irrigation water. Discuss in specific the shortcomings of volumetric assessment methods.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer book.

Civil Engineering ENGINEERING MATHEMATICS – III

- 2) Use of calculator is allowed.
- 3) Figures to the right indicate full marks.s

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the answers. 14

 $L^{-1}\left\{\frac{1}{(s+100)^2}\right\} = _$ ______. 1) $e^{-100t}t$ $e^{100t}t$ b) a) c) e^{-100t} d) e^{100t} t The value of the integral $\int_0^\infty e^{-3t} t \sin t \, dt$ is _____. 2) b) $\frac{2}{55}$ d) $\frac{4}{4}$ a) 1 50 3 c) The solution of $q = e^{-p/m}$ is _____. 3) a) $z = ax + e^{a/m}y + c$ b) $z = ax + e^{-a/m}y + c$ c) $z = ax + e^{-m/a}y + c$ d) $z = ax + e^{m/a}v + c$ The solution of yzp + zxq = xy is _____. a) $\phi[x^2 + y^2, y^2 + z^2] = 0$ b) $\phi[x^3 + y^3, y^3 + z^3] = 0$ c) $\phi[x^2 - y^2, y^2 - z^2] = 0$ d) None of these 4) The general solution of $x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} = 0$ is _____. a) $y = c_1 + e^x$ b) $y = c_1 + c_2 x^2$ c) $v = c_1 x + c_2$ d) $y = c_1 + c_2 \log x$ 5) The particular integral of $\frac{d^4y}{dx^4} - a^4y = \sin ax$ is _____. 6) b) $x \cos a x$ a) $x \sin ax$ 4*a*³ $4a^{3}$ $-x\cos ax$ $-x \sin ax$ d) C) $4a^{3}$ $4a^3$

SLR-FM-631



Max. Marks: 70

Seat

No.

			SLR-FM-631
			Set P
7)	The complementary function of $(D^3$ a) $y_c = c_1 + c_2 e^{-2x} + c_3 e^{-3x}$ c) $y_c = c_1 + c_2 e^{2x} + c_3 e^{3x}$	- D ² b) d)	$(-6D)y = x^2 + 1$ is $y_c = c_1 x + c_2 e^{-2x} + c_3 e^{-3x}$ None of these
8)	If $\overline{F} = (x + 3y)i + (y - 2z)j + (x + a)$ a) 0 c) 2	z) <i>k</i> is b) d)	Solenoidal then $a =$. 1 -2
9)	If $\bar{r} = xi + yj + zk$ and \bar{a} is a constant a) \bar{a} c) \bar{r}	nt vect b) d)	tor then $\nabla (\bar{a}.\bar{r}) = $ $2\bar{a}$ r
10)	Fourier expansion of $f(x) = \frac{-x -2 \le x \le 0}{x 0 \le x \le 2}$ in the interval a) no cosine terms c) Both sine and cosine terms	val [-2 b) d)	, 2] has no sine terms none of these
11)	In the interval $[0, \pi]$ the constant term is a) $\frac{\pi}{2}$.	n in th b) d)	the cosine series of $f(x) = x$ $\frac{0}{\frac{\pi}{4}}$
12)	The value of coefficient of correlation a) 0 and 1 c) -1 and 1	n r lies b) d)	between 1 and 2 -1 and 0
13)	If mean of x is 3 and mean of y is -1 3 then the line of regression of y on a) $3x - y = 10$ c) $x - 3y = 6$, the r x is b) d)	egression coefficient of y on x is x + 3y = 10 3x - y = 70
14)	The variance for a binomial distributi a) <i>np</i> c) <i>npq</i>	on is b) d)	$\sqrt{np} \sqrt{npq}$

Seat	
No.	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MATHEMATICS – III

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 and Q.9 is compulsory.

- 1) Attempt any two questions from the remaining questions of each section.
- 2) Figures to the right indicate full marks.
- 3) Use of calculator is allowed.

Section – I

Q.2 a) Solve
$$(D^2 + g)y = e^x - \cos 2x$$
.
b) Solve $(D^2 - 2D + 1)y - \frac{3e^x}{2}$
03

c) Solve
$$(D^2 - 2D + 1)y = \frac{1}{x^2}$$

c) Solve $(D^2 + 3D + 2)y = e^{ex}$

OR

c) Solve $(D^2 + a^2)y = x \sin ax$

Q.3 a) Solve
$$(x^2D^2 - 3xD + 1)y = \frac{\sin(\log x) + 1}{2}$$
 04

b) The differential equation of a beam uniformly loaded with one end fixed and **05** second subjected to a compressive force is given by. $EI\frac{d^2y}{dx^2} + Py = -\frac{1}{2}Wx^2$ where *E*, *P*, *I* and *W* are constants. If y = 0 and $\frac{dy}{dx} = 0$ at x = 0, prove that

$$y = -\frac{W}{Pn^2}\cos nx - \frac{W}{2P}(x^2 - \frac{2}{n^2})$$

Where $n^2 = \frac{P}{EI}$

Q.4 a) Solve
$$p^2 - q^2 = zp$$

b) Solve $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \left(\frac{1}{y} - \frac{1}{x}\right)$
c) Solve the following differential equation 03

c) Solve the following differential equation $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ by the method of separation of variables.

Q.5 Attempt any three

a) Find inverse Laplace transform of the following by convolution theorem.

$$\frac{1}{(s+3)(s-1)}$$

b) Find
$$L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$$

- **c)** Find $L\left\{\frac{1}{t}(e^{-3t}\sin 2t)\right\}$
- d) Using Laplace transform solve the following differential equation with the given conditions.

 $\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} - 3y = 0$ at $x = 0, y = 0, \frac{dy}{dx} = 4$

Max. Marks: 56

Set

09

04

		SLR-FM-6	31
		Set	Ρ
		Section - II	
Q.6	a)	Find the Fourier series expansion of	05
		$f(x) = x + \frac{x^2}{4}, -\pi < x < \pi$	
	b)	Find half-range cosine series for $f(x) = kx \qquad 0 \le x \le l/2$ $= k(l-x) \qquad l/2 \le x \le l$	04
	b)	Find the Fourier series expansion of $f(x) = x^2 - 2, -2 \le x \le 2$	04
Q.7	a)	Find the angle between the tangents to the curve $\overline{x} = t^2 i + 2t i - t^3 k$ at the points $t = 1$	03
	b)	$r = t^{-}t + 2tj - t^{-}k$ at the points $t = \pm 1$ Find the Divergence and Curl of the vector.	03
	c)	$\overline{v} = (xyz)i + (3x^2y)j + (xz^2 - y^2z)k \text{ at the point } (2, -1, 1)$	03
<u> </u>	, _)	If $r = xt + yj + 2k$, prove that $\frac{1}{r^3}$ is Solenoidal.	02
Q.8	a)	x: 0 1 2 3 4 $y: 1 2.9 4.8 6.7 8.6$	03
	b)	The probabilities of a Poisson variate taking the values 3 and 4 are equal.	03
	c)	Calculate the probabilities of the variable taking the values 0 and 2. A random variable X has the following function.	03
	·	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	
Q.9	a)	The mean yield per plot of a crop is 17kg and standard deviation is 3kg. If the distribution of yield per plot is normal, find the percentage of plots given yields. 1) Between 15.5 kg and 20 kg 2) More than 20 kg [Given for S.N.V.Z area from $z = 0 \& 0.5$ is 0.1915 and that from $z = 0 \& z = 1$ is 0.3413]	05
	b)	In a partially destroyed laboratory record of an analysis of a correlation data, the following results are only eligible variance of $x = 9$. Regression equations: $8x - 10y + 66 = 0$, $40x - 18y = 214$ What were: 1) The mean values of x and y 2) The standard deviation of y 3) Correlation of coefficient between x and y	05

	Civil Eng ENGINEERING MA	ineeri ATHEN	ng MATICS – III
Day & Da Time: 02	ate: Thursday, 28-11-2019 :30 PM To 05:30 PM		Max. Marks: 70
Instructi	 ons: 1) Q. No. 1 is compulsory. It sh book. 2) Use of calculator is allowed. 3) Figures to the right indicate fu 	nould be	e solved in first 30 minutes in Answer s.s
	MCQ/Objective	Type Q	uestions
Duration	30 Minutes		Marks: 14
Q.1 Ch 1)	oose the correct alternatives from the field of the correct alternatives from the field of the	the opt az)k is b) d)	tions and rewrite the answers. 14 Solenoidal then $a = .$ 1 -2
2)	If $\bar{r} = xi + yj + zk$ and \bar{a} is a constant a) \bar{a} c) \bar{r}	ant vect b) d)	for then $\nabla(\bar{a}.\bar{r}) = $ $2\bar{a}$ r
3)	Fourier expansion of $f(x) = \frac{-x}{x} \begin{array}{c} -2 \le x \le 0 \\ x 0 \le x \le 2 \end{array}$ in the interval a) no cosine terms c) Both sine and cosine terms	rval [-2 b) d)	, 2] has no sine terms none of these
4)	In the interval $[0, \pi]$ the constant te is a) π c) $\frac{\pi}{2}$	rm in th b) d)	the cosine series of $f(x) = x$ $\frac{0}{\frac{\pi}{4}}$
5)	The value of coefficient of correlation a) 0 and 1 c) -1 and 1	on r lies b) d)	between 1 and 2 -1 and 0
6)	If mean of x is 3 and mean of y is - 3 then the line of regression of y or a) $3x - y = 10$ c) $x - 3y = 6$	1, the ro n <i>x</i> is b) d)	egression coefficient of y on x is x + 3y = 10 3x - y = 70
7)	The variance for a binomial distribu a) <i>np</i> c) <i>npq</i>	ution is ₋ b) d)	$\sqrt{np} \sqrt{npq}$

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Seat

No.

SLR-FM-631

Set Q

Set $L^{-1}\left\{\frac{1}{(s+100)^2}\right\} = \underline{\qquad}.$ 8) b) $e^{100t}t$ a) $e^{-100t}t$ c) e^{-100t} d) e^{100t} The value of the integral $\int_{0}^{\infty} e^{-3t} t \sin t \, dt$ is _____. 9) 2 55 4 a) 1 b) 50 3 50 d) C) 10) The solution of $q = e^{-p/m}$ is _____. a) $z = ax + e^{a/m}y + c$ b) $z = ax + e^{-a/m}y + c$ c) $z = ax + e^{-m/a}y + c$ d) $z = ax + e^{m/a}y + c$ d) z = ux + cThe solution of yzp + zxq = xy is _____. a) $\phi[x^2 + y^2, y^2 + z^2] = 0$ b) $\phi[x^3 + y^3, y^3 + z^3] = 0$ $f(x^2 + y^2, y^2 - z^2) = 0$ d) None of these 11) The general solution of $x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} = 0$ is _____. a) $y = c_1 + e^x$ b) $y = c_1 + c_2 x^2$ c) $y = c_1 x + c_2$ d) $y = c_1 + c_2 \log x$ 12) The particular integral of $\frac{d^4y}{dx^4} - a^4y = \sin ax$ is _____. 13) $\frac{4a^3}{-x\cos ax}$ $4a^3$ $-x \sin ax$ d) c) $4a^3$ The complementary function of $(D^3 - D^2 - 6D)y = x^2 + 1$ is _____. a) $y_c = c_1 + c_2 e^{-2x} + c_3 e^{-3x}$ b) $y_c = c_1 x + c_2 e^{-2x} + c_3 e^{-3x}$ c) $y_c = c_1 + c_2 e^{2x} + c_3 e^{3x}$ d) None of these 14)

SLR-FM-631

Seat	
No.	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MATHEMATICS – III

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 and Q.9 is compulsory.

- 1) Attempt any two questions from the remaining questions of each section.
- 2) Figures to the right indicate full marks.
- 3) Use of calculator is allowed.

Section – I

Q.2 a) Solve
$$(D^2 + g)y = e^x - \cos 2x$$
.
b) Solve $(D^2 - 2D + 1)y = \frac{3e^x}{2}$

c) Solve
$$(D^2 + 3D + 2)y = \frac{1}{x^2}e^{ex}$$

OR

c) Solve $(D^2 + a^2)y = x \sin ax$

Q.3 a) Solve
$$(x^2D^2 - 3xD + 1)y = \frac{\sin(\log x) + 1}{2}$$
 04

b) The differential equation of a beam uniformly loaded with one end fixed and **05** second subjected to a compressive force is given by. $EI\frac{d^2y}{dx^2} + Py = -\frac{1}{2}Wx^2$ where *E*, *P*, *I* and *W* are constants. If y = 0 and $\frac{dy}{dx} = 0$ at x = 0, prove that

$$y = -\frac{W}{Pn^2}\cos nx - \frac{W}{2P}(x^2 - \frac{2}{n^2})$$

Where $n^2 = \frac{P}{EI}$

Q.4 a) Solve
$$p^2 - q^2 = zp$$

b) Solve $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \left(\frac{1}{y} - \frac{1}{x}\right)$
c) Solve the following differential equation 03

c) Solve the following differential equation $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ by the method of separation of variables.

Q.5 Attempt any three

a) Find inverse Laplace transform of the following by convolution theorem. $\frac{1}{1}$

$$\frac{1}{(s+3)(s-1)}$$

b) Find
$$L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$$

- **c)** Find $L\left\{\frac{1}{t}(e^{-3t}\sin 2t)\right\}$
- d) Using Laplace transform solve the following differential equation with the given conditions.

 $\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} - 3y = 0 \text{ at } x = 0, y = 0, \frac{dy}{dx} = 4$

Max. Marks: 56

Set

09

04

		SLR-FM-6	31
		Set	Q
		Section - II	
Q.6	a)	Find the Fourier series expansion of	05
		$f(x) = x + \frac{x^2}{4}, -\pi < x < \pi$	
	b)	Find half-range cosine series for $f(x) = kx$ $0 \le x \le l/2$	04
		$= k(l-x) l/2 \le x \le l$ OR	
	b)	Find the Fourier series expansion of $f(x) = x^2 - 2, -2 \le x \le 2$	04
Q.7	a)	Find the angle between the tangents to the curve $\overline{x} = x^2 i + 2x^2 i + 3x^2 i + $	03
	b)	$r = t^2 t + 2tj - t^3 k$ at the points $t = \pm 1$ Find the Divergence and Curl of the vector. $\overline{v} = (xyz)i + (3x^2y)j + (xz^2 - y^2z)k$ at the point $(2, -1, 1)$	03
	c)	If $\overline{r} = xi + yj + zk$, prove that $\frac{\overline{r}}{r^3}$ is Solenoidal.	03
Q.8	a)	Fit a Straight line to the following data.	03
		x: 0 1 2 3 4 y: 1 2.9 4.8 6.7 8.6	
	b)	The probabilities of a Poisson variate taking the values 3 and 4 are equal.	03
	c)	Calculate the probabilities of the variable taking the values 0 and 2. A random variable X has the following function.	03
	,	x: 0 1 2 3 4 5 6 7	
		1) Find K 1	
		2) Evaluate $P(X < 6), P(3 < X \le 6)$	
Q.9	a)	The mean yield per plot of a crop is 17kg and standard deviation is 3kg. If the distribution of yield per plot is normal, find the percentage of plots given yields.	05
		1) Between 15.5 kg and 20 kg	
		[Given for S.N.V.Z area from $z = 0 \& 0.5$ is 0.1915 and that from $z = 0 \&$	
	г.)	z = 1 is 0.3413]	05
	D)	In a partially destroyed laboratory record of an analysis of a correlation data, the following results are only eligible variance of $x = 9$.	05
		Regression equations: $8x - 10y + 66 = 0$, $40x - 18y = 214$	
		What were: 1) The mean values of r and y	
		2) The standard deviation of v	
		3) Correlation of coefficient between x and y	
S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer book.

ENGINEERING MATHEMATICS – III

- 2) Use of calculator is allowed.
- 3) Figures to the right indicate full marks.s

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the answers. 14

The general solution of $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} = 0$ is _____. 1)

a)	$y = c_1 + e^x$		b)	$y = c_1 + c_2 x^2$
C)	$y = c_1 x + c_2$	(d)	$y = c_1 + c_2 \log x$

2)	The particular integral of $\frac{d^4y}{dx^4} - a^4y = \sin ax$ is					
	a)	$x \sin a x$	b)	$x \cos a x$		
		4~3	,	Δa^3		

c) $\frac{\frac{4a^3}{-x\sin ax}}{4a^3}$	d)	$\frac{-x\cos ax}{4a^3}$
The complementary function of (D^3)	2ת	$(D) = \alpha^2$

The complementary function of $(D^3 - D^2 - 6D)y = x^2 + 1$ is _____. a) $y_c = c_1 + c_2 e^{-2x} + c_3 e^{-3x}$ b) $y_c = c_1 x + c_2 e^{-2x} + c_3 e^{-3x}$ c) $v_c = c_1 + c_2 e^{2x} + c_2 e^{3x}$ d) None of these 3) c) $y_c = c_1 + c_2 e^{2x} + c_3 e^{3x}$ d) None of these

If $\overline{F} = (x + 3y)i + (y - 2z)j + (x + az)k$ is Solenoidal then a = .4) a) 0 b) 1 c) 2 d) -2

5) If
$$\bar{r} = xi + yj + zk$$
 and \bar{a} is a constant vector then $\nabla(\bar{a}.\bar{r}) =$ _____
a) \bar{a} b) $2\bar{a}$

c) \bar{r} d) r Fourier expansion of _ 6) $f(x) = -x \quad -2 \le x \le 0$ in the interval [-2, 2] has _____. x $0 \le x \le 2$ no cosine terms a) b) no sine terms Both sine and cosine terms none of these c) d) In the interval $[0, \pi]$ the constant term in the cosine series of f(x) = x7) is ____. 0 a) π b)

π

d)

	2	$\overline{4}$
8)	The value of coefficient of o	correlation r lies between
	a) 0 and 1	b) 1 and 2
	c) -1 and 1	d) -1 and 0

π

c)



Set

Marks: 14

Max. Marks: 70

Set | R 9) If mean of x is 3 and mean of y is -1, the regression coefficient of y on x is 3 then the line of regression of y on x is _ . 3x - y = 10x + 3y = 10a) b) 3x - y = 70C) x - 3y = 6d) The variance for a binomial distribution is 10) b) a) np \sqrt{np} C) d) \sqrt{npq} npq $L^{-1}\left\{\frac{1}{(s+100)^2}\right\} = \underline{\qquad}.$ 11) $e^{100t}t$ $e^{-100t}t$ b) a) c) e^{-100t} e^{100t} d) t t $\int_0^\infty e^{-3t} t \sin t \, dt \text{ is } ___.$ The value of the integral 12) 2 55 4 b) a) 1 50 3 d) c) 50 The solution of $q = e^{-p/m}$ is _____. 13) a) $z = ax + e^{a/m}y + c$ b) $z = ax + e^{-a/m}y + c$ c) $z = ax + e^{-m/a}y + c$ d) $z = ax + e^{m/a}y + c$ The solution of yzp + zxq = xy is _____ a) $\phi[x^2 + y^2, y^2 + z^2] = 0$ c) $\phi[x^2 - y^2, y^2 - z^2] = 0$ 14) b) $\phi[x^3 + y^3, y^3 + d]$ d) None of these b) $\phi[x^3 + y^3, y^3 + z^3] = 0$

Page 10 of 16

SLR-FM-631

Seat	
No.	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MATHEMATICS – III

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 and Q.9 is compulsory.

- 1) Attempt any two questions from the remaining questions of each section.
- 2) Figures to the right indicate full marks.
- 3) Use of calculator is allowed.

Section – I

Q.2 a) Solve
$$(D^2 + g)y = e^x - \cos 2x$$
.
b) Solve $(D^2 - 2D + 1)y = \frac{3e^x}{2}$
03

c) Solve
$$(D^2 - 2D + 1)y = \frac{1}{x^2}$$

c) Solve $(D^2 + 3D + 2)y = e^{ex}$ 04

OR

c) Solve $(D^2 + a^2)y = x \sin ax$ **04**

Q.3 a) Solve
$$(x^2D^2 - 3xD + 1)y = \frac{\sin(\log x) + 1}{2}$$
 04

b) The differential equation of a beam uniformly loaded with one end fixed and **05** second subjected to a compressive force is given by. $EI\frac{d^2y}{dx^2} + Py = -\frac{1}{2}Wx^2$ where *E*, *P*, *I* and *W* are constants. If y = 0 and $\frac{dy}{dx} = 0$ at x = 0, prove that W and W are constants. If y = 0 and $\frac{dy}{dx} = 0$ at x = 0, prove that W and W are constants.

$$y = -\frac{W}{Pn^2}\cos nx - \frac{W}{2P}(x^2 - \frac{2}{n^2})$$

Where $n^2 = \frac{P}{EI}$

Q.4 a) Solve
$$p^2 - q^2 = zp$$

b) Solve $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \left(\frac{1}{y} - \frac{1}{x}\right)$
c) Solve the following differential equation
03

c) Solve the following differential equation $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ by the method of separation of variables.

Q.5 Attempt any three

a) Find inverse Laplace transform of the following by convolution theorem. $\frac{1}{1}$

$$\frac{1}{(s+3)(s-1)}$$

b) Find
$$L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$$

- **c)** Find $L\left\{\frac{1}{t}(e^{-3t}\sin 2t)\right\}$
- d) Using Laplace transform solve the following differential equation with the given conditions.

 $\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} - 3y = 0$ at $x = 0, y = 0, \frac{dy}{dx} = 4$

Set

Max. Marks: 56

		SLR-FM-6	31
		Set	R
		Section - II	
Q.6	a)	Find the Fourier series expansion of	05
		$f(x) = x + \frac{x^2}{4}, -\pi < x < \pi$	
	b)	Find half-range cosine series for $f(x) = kx \qquad 0 \le x \le l/2$ $= k(l-x) \qquad l/2 \le x \le l$	04
	b)	Find the Fourier series expansion of $f(x) = x^2 - 2, -2 \le x \le 2$	04
Q.7	a)	Find the angle between the tangents to the curve	03
	b)	$r = t^2 i + 2tj - t^3 k$ at the points $t = \pm 1$ Find the Divergence and Curl of the vector. $\overline{v} = (xyz)i + (3x^2y)j + (xz^2 - y^2z)k$ at the point (2, -1,1)	03
	c)	If $\overline{r} = xi + yj + zk$, prove that $\frac{\overline{r}}{r^3}$ is Solenoidal.	03
Q.8	a)	Fit a Straight line to the following data. x: 0 1 2 3 4 y: 1 29 49 (7 9)	03
	b)	The probabilities of a Poisson variate taking the values 3 and 4 are equal.	03
	,	Calculate the probabilities of the variable taking the values 0 and 2.	
	C)	A random variable X has the following function. $x : 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7$ $P(x): 0 \ k \ 2k \ 2k \ 3k \ k^2 \ 2k^2 \ 7k^2 + k$ 1) Find K 2) Evaluate $P(X < 6), P(3 < X \le 6)$	03
Q.9	a)	The mean yield per plot of a crop is 17kg and standard deviation is 3kg. If the distribution of yield per plot is normal, find the percentage of plots given yields. 1) Between 15.5 kg and 20 kg 2) More than 20 kg [Given for S.N.V.Z area from $z = 0 \& 0.5$ is 0.1915 and that from $z = 0 \& z = 1$ is 0.3413]	05
	b)	In a partially destroyed laboratory record of an analysis of a correlation data, the following results are only eligible variance of $x = 9$. Regression equations: $8x - 10y + 66 = 0$, $40x - 18y = 214$ What were: 1) The mean values of x and y 2) The standard deviation of y 3) Correlation of coefficient between x and y	05

Max. Marks: 70 book. 2) Use of calculator is allowed. 3) Figures to the right indicate full marks.s **MCQ/Objective Type Questions** Fourier expansion of $-x \quad -2 \le x \le 0$ in the interval [-2, 2] has . f(x) =x 0 < x < 2a) no cosine terms b) no sine terms Both sine and cosine terms d) c) none of these In the interval $[0, \pi]$ the constant term in the cosine series of f(x) = xis

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the answers.

- 1)
- 2) a) b) 0 π π π c) d) 2 4 The value of coefficient of correlation r lies between _____. 3) 0 and 1 1 and 2 a) b) -1 and 1 d) C) -1 and 0
- 4) If mean of x is 3 and mean of y is -1, the regression coefficient of y on x is 3 then the line of regression of y on x is _____ $\frac{1}{r+3v} = 10$ a) 3x - y = 10h)

	a) $5x - y - 10$	D)	x + 5y = 10
	c) $x - 3y = 6$	d)	3x - y = 70
5)	The variance for a binomi	al distribution is	·
	a) <i>np</i>	b)	\sqrt{np}
	c) npq	d)	\sqrt{npq}
6)	$L^{-1}\left\{\frac{1}{(s+100)^2}\right\} = \underline{\qquad}.$		
	a) $e^{-100t}t$	b)	$e^{100t}t$
	c) e^{-100t}	d)	e^{100t}
	\overline{t}		t
7)	The value of the integral	$\int_0^\infty e^{-3t} t \sin t$	<i>dt</i> is
	a) 1	b)	2
	50		55
	c) $\frac{3}{12}$	d)	4
	50		55

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer

SLR-FM-631

Marks: 14

Seat	
No.	

Set S The solution of $q = e^{-p/m}$ is _____. 8) a) $z = ax + e^{a/m}y + c$ b) $z = ax + e^{-a/m}y + c$ C) $z = ax + e^{-m/a}y + c$ d) $z = ax + e^{m/a}y + c$ 9) The solution of yzp + zxq = xy is _____ a) $\phi[x^2 + y^2, y^2 + z^2] = 0$ c) $\phi[x^2 - y^2, y^2 - z^2] = 0$ b) $\phi[x^3 + y^3, y^3 + z^3] = 0$ d) None of these The general solution of $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} = 0$ is _____. a) $y = c_1 + e^x$ b) $y = c_1 + c_2 x^2$ c) $y = c_1 x + c_2$ d) $y = c_1 + c_2 \log x$ 10) The particular integral of $\frac{d^4y}{dx^4} - a^4y = \sin ax$ is _____. a) $\frac{x \sin ax}{4a^3}$ b) $\frac{x \cos ax}{4a^3}$ c) $\frac{-x \sin ax}{4a^3}$ d) $\frac{-x \cos ax}{4a^3}$ 11) $4a^3$ The complementary function of $(D^3 - D^2 - 6D)y = x^2 + 1$ is _____. a) $y_c = c_1 + c_2 e^{-2x} + c_3 e^{-3x}$ b) $y_c = c_1 x + c_2 e^{-2x} + c_3 e^{-3x}$ c) $y_c = c_1 + c_2 e^{2x} + c_3 e^{3x}$ d) None of these 12) 13) If $\overline{F} = (x + 3y)i + (y - 2z)j + (x + az)k$ is Solenoidal then a = .a) 0 b) 1 c) 2 d) -2 If $\bar{r} = xi + yj + zk$ and \bar{a} is a constant vector then $\nabla(\bar{a}.\bar{r}) =$ _____. 14) a) ā b)

c) \bar{r}

2ā d) r

SLR-FM-631

Seat	
No.	

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MATHEMATICS – III

Day & Date: Thursday, 28-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.2 and Q.9 is compulsory.

- 1) Attempt any two questions from the remaining questions of each section.
- 2) Figures to the right indicate full marks.
- 3) Use of calculator is allowed.

Section – I

Q.2 a) Solve
$$(D^2 + g)y = e^x - \cos 2x$$
.
b) Solve $(D^2 - 2D + 1)y = \frac{3e^x}{2}$
03

c) Solve
$$(D^2 + 3D + 2)y = \frac{1}{x^2}e^{ex}$$

OR

c) Solve $(D^2 + a^2)y = x \sin ax$

Q.3 a) Solve
$$(x^2D^2 - 3xD + 1)y = \frac{\sin(\log x) + 1}{2}$$
 04

b) The differential equation of a beam uniformly loaded with one end fixed and **05** second subjected to a compressive force is given by. $EI\frac{d^2y}{dx^2} + Py = -\frac{1}{2}Wx^2$ where *E*, *P*, *I* and *W* are constants. If y = 0 and $\frac{dy}{dx} = 0$ at x = 0, prove that $W = \frac{2}{2}$

$$y = -\frac{w}{Pn^2}\cos nx - \frac{w}{2P}(x^2 - \frac{z}{n^2})$$

Where $n^2 = \frac{P}{EI}$

Q.4 a) Solve
$$p^2 - q^2 = zp$$

b) Solve $\left(\frac{1}{z} - \frac{1}{y}\right)p + \left(\frac{1}{x} - \frac{1}{z}\right)q = \left(\frac{1}{y} - \frac{1}{x}\right)$
c) Solve the following differential equation 03

c) Solve the following differential equation $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ by the method of separation of variables.

Q.5 Attempt any three

a) Find inverse Laplace transform of the following by convolution theorem.

$$\frac{1}{(s+3)(s-1)}$$

b) Find
$$L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$$

- **c)** Find $L\left\{\frac{1}{t}(e^{-3t}\sin 2t)\right\}$
- d) Using Laplace transform solve the following differential equation with the given conditions.

 $\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} - 3y = 0$ at $x = 0, y = 0, \frac{dy}{dx} = 4$

Max. Marks: 56

Set

09

04

		SLR-FM-6	31
		Set	S
		Section - II	
Q.6	a)	Find the Fourier series expansion of	05
		$f(x) = x + \frac{x^2}{4}, -\pi < x < \pi$	
	b)	Find half-range cosine series for $f(x) = kx \qquad 0 \le x \le l/2$ $= k(l-x) \qquad l/2 \le x \le l$	04
	b)	Find the Fourier series expansion of $f(x) = x^2 - 2, -2 \le x \le 2$	04
Q.7	a)	Find the angle between the tangents to the curve $\overline{x} = t^2 i + 2t i = t^3 k$ at the points $t = +1$	03
	b)	Find the Divergence and Curl of the vector. $\overline{v} = (xyz)i + (3x^2y)j + (xz^2 - y^2z)k$ at the point (2, -1,1)	03
	c)	If $\overline{r} = xi + yj + zk$, prove that $\frac{\overline{r}}{r^3}$ is Solenoidal.	03
Q.8	a)	Fit a Straight line to the following data. x: 0 1 2 3 4	03
		<i>y</i> : 1 2.9 4.8 6.7 8.6	•••
	D)	Calculate the probabilities of the variable taking the values 3 and 4 are equal.	03
	c)	A random variable X has the following function. $x : 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7$ $P(x): 0 \ k \ 2k \ 2k \ 3k \ k^2 \ 2k^2 \ 7k^2 + k$ 1) Find <i>K</i> 2) Evaluate $P(X < 6), P(3 < X \le 6)$	03
Q.9	a)	The mean yield per plot of a crop is 17kg and standard deviation is 3kg. If the distribution of yield per plot is normal, find the percentage of plots given yields. 1) Between 15.5 kg and 20 kg 2) More than 20 kg [Given for S.N.V.Z area from $z = 0 \& 0.5$ is 0.1915 and that from $z = 0 \& z = 1$ is 0.3413]	05
	b)	In a partially destroyed laboratory record of an analysis of a correlation data, the following results are only eligible variance of $x = 9$. Regression equations: $8x - 10y + 66 = 0$, $40x - 18y = 214$ What were: 1) The mean values of x and y 2) The standard deviation of y 3) Correlation of coefficient between x and y	05

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF STEEL STRUCTURES**

Day & Date: Friday, 06-12-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 3) Use of scientific non programmable calculator is allowed.
- 4) Figures to the right indicate full marks.
- 5) Assume suitable data if necessary and mention it clearly before the Solution.
- 6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

C)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

The collapse load for a cantilever beam of span I subjected to uniformly 1) distributed load is .

b)

7.67 Mp/I

- a) 0.414 Mp/I
 - 11.656 Mp/I none of the above d)
- 2) The thickness of base plate s determined from the .
 - flexural strength of the plate a)
 - shear strength of plate b)
 - bearing strength of concrete pedestal c)
 - punching criteria d)
- 3) The best arrangement to provide unified behavior in built up steel column is by
 - lacing a)
 - b) battening perforated cover plates tie plates d) c)
- The partial safety factors for dead load and live load for a roof truss for 4) limit state of serviceability respectively
 - 1.2 and 1.0 1 and 1.5 b) a)
 - c) 1.2 and 1.5 1.0 and 1.0 d)
- The economical spacing of a roof truss depends upon the . 5)
 - cost of purlin and cost of roof covering a)
 - cost of roof covering and dead load of the roof truss b)
 - dead load and live loads C)
 - live loads and cost of purlin d)
- A gusset plate is subjected to 6)
 - a) direct stress b) shear stress bending stress all of the above d)
 - C) A beam section is selected and provided on the basis of
- 7) section modulus deflection b) a)
 - c) shear d)
- - all of the above

SLR-FM-632

Max. Marks: 70

Marks: 14

Seat No.

Set 8) The shear lag effect in beam flanges are disregarded when the outstand of the beam flange is less than or equal to Lo/10 Lo/15 a) b) C) Lo/20 d) Lo 9) Battening is preferred when the _ column carries axial load only a) space between two main components is not very large b) both a & b C) none of the above d) 10) The thickness of double flat lacing should not be less than _____. 1/30th length between inner rivets a) 1/40th length between inner rivets b) 1/50th length between inner rivets c) 1/60th length between inner rivets d) 11) The number of possible plastic hinges for a propped cantilever beam is _____. 1 a) 2 b) C) 3 d) zero 12) The length of the plastic hinge for a simply supported beam of span L subjected to a central point load is of rectangular section. L/3 2L/3a) b) c) L/2 d) none of the above 13) Design of beam is governed by shear When the depth of the beam section is small a) when the large concentrated loads are placed near beam supports b) both a & b c) none of the above is correct d) 14) The thickness of battens flat should not be less than . 1/30th length between inner line of rivets a) 1/40th length between inner line of rivets b)

- c) $1/50^{\text{th}}$ length between inner line of rivets
- d) 1/60th length between inner line of rivets

SLR-FM-632

Seat	
No.	

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF STEEL STRUCTURES

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gusset plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- a) Salient features of limit state method of design of steel structures.
- b) Advantages and disadvantages of welded connection over bolted connection.
- c) Behaviour of bolted joints.

Section – II

- Q.6 A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mmc/c spacing of beams = 3mImposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.



Max. Marks: 56

SLR-FM-632 Set P

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

Seat No.

Max. Marks: 70

Set

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF STEEL STRUCTURES**

Day & Date: Friday, 06-12-2019

Time: 02:30 PM To 06:30 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
 - 3) Use of scientific non programmable calculator is allowed.
 - 4) Figures to the right indicate full marks.
 - 5) Assume suitable data if necessary and mention it clearly before the Solution.

6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The shear lag effect in beam flanges are disregarded when the outstand of 1) the beam flange is less than or equal to
 - a) Lo/10 $L_0/15$ b)
 - Lo/20 d) C) Lo
 - 2) Battening is preferred when the
 - column carries axial load only a)
 - space between two main components is not very large b)
 - c) both a & b
 - none of the above d)
 - 3) The thickness of double flat lacing should not be less than .
 - 1/30th length between inner rivets a)
 - 1/40th length between inner rivets b)
 - 1/50th length between inner rivets c)
 - 1/60th length between inner rivets d)

4) The number of possible plastic hinges for a propped cantilever beam is _____.

- 2 a) b) 1
- C) 3 d) zero
- 5) The length of the plastic hinge for a simply supported beam of span L subjected to a central point load is of rectangular section.
 - a) L/3 L/2 c)

- b) 2L/3d) none of the above
- 6) Design of beam is governed by shear
 - When the depth of the beam section is small a)
 - b) when the large concentrated loads are placed near beam supports
 - both a & b c)
 - none of the above is correct d)
- 7) The thickness of battens flat should not be less than _____.
 - 1/30th length between inner line of rivets a)
 - 1/40th length between inner line of rivets b)
 - 1/50th length between inner line of rivets c)
 - 1/60th length between inner line of rivets d)

distributed load is _____. a) 0.414 Mp/l b) 7.67 Mp/I c) 11.656 Mp/l d) none of the above 9) The thickness of base plate s determined from the _____. flexural strength of the plate a) shear strength of plate b) bearing strength of concrete pedestal c) punching criteria d) 10) The best arrangement to provide unified behavior in built up steel column is by _____. a) lacing b) battening d) perforated cover plates c) tie plates The partial safety factors for dead load and live load for a roof truss for 11) limit state of serviceability respectively _ a) 1 and 1.5 b) 1.2 and 1.0 c) 1.0 and 1.0 d) 1.2 and 1.5 12) The economical spacing of a roof truss depends upon the _____. cost of purlin and cost of roof covering a) cost of roof covering and dead load of the roof truss b) c) dead load and live loads live loads and cost of purlin d) A gusset plate is subjected to _____. 13) direct stress b) shear stress a) bending stress all of the above c) d) 14) A beam section is selected and provided on the basis of _____. section modulus deflection a) b) all of the above c) shear d)

The collapse load for a cantilever beam of span I subjected to uniformly

8)

SLR-FM-632

Set Q

Seat No.

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF STEEL STRUCTURES

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gussetO9 plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- a) Salient features of limit state method of design of steel structures.
- **b)** Advantages and disadvantages of welded connection over bolted connection.
- c) Behaviour of bolted joints.

Section – II

- Q.6 A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mmc/c spacing of beams = 3mImposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.



Max. Marks: 56

SLR-FM-632 Set Q

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

Seat No.								Set	R
		T.E.	(Part - I)	(Old) (CGPA	A) Exam	nina	ation Nov/Dec-20	19	
			DE	SIGN OF ST	EEL ST	RU	y JCTURES		
Day & Day	ate: F	Frida	y, 06-12-20)19				Max. Marks	: 70
Instructi	ions:	1) C	Q. No. 1 is c	ompulsory and	l should b	be s	olved in first 30 minu	ites in answe	r
		ל 2) נ	book. Jse of IS 80	0-2007 and IS	875 are a	allo	wed, but not allowed	for MCQ	
		(3) l	Q. No. 1) Jse of scien	ntific non progra	ammable	cal	culator is allowed.		
		4) F 5) A S	Figures to th Assume suit Solution.	ne right indicate table data if neo	e full mark cessary a	ks. Ind	mention it clearly be	fore the	
		6) [Draw the ap	propriate sketc	hes wher	nev Durc	er necessary.		
Duration	: 30 N	Minu	tes		ve Type (zut	50005	Marks	: 14
Q.1 C 1	Choos) 	se tl The a) b) c) d)	ne correct a economical cost of purli cost of roof dead load a live loads a	alternatives fro I spacing of a ro in and cost of r covering and c and live loads and cost of purli	om the o oof truss oof cover dead load n	ptic dep ing I of	ons and rewrite the bends upon the the roof truss	sentence. 	14
2	2) / a	A gu a) c)	isset plate is direct stress bending stre	s subjected to ₋ s ess	 b d))	shear stress all of the above		
3	3) / a	Ábe a) c)	eam section section mo shear	is selected and odulus	d provide b d	, d oi))	n the basis of deflection all of the above		
4	+) - t a	The the t a) c)	shear lag e beam flange Lo/10 Lo/20	ffect in beam fl e is less than oi	anges are r equal to k	e di c) d)	sregarded when the Lo/15 Lo	outstand of	
5	5) 	Batto a) b) c) d)	ening is pre column carr space betw both a & b none of the	ferred when the ries axial load o veen two main o above	e only compone	nts	is not very large		
6	5) - 1 0 0	The a) b) c) d)	thickness o 1/30 th lengt 1/40 th lengt 1/50 th lengt 1/60 th lengt	of double flat lac ih between inne ih between inne ih between inne ih between inne	cing shou er rivets er rivets er rivets er rivets	ld r	not be less than		
7	7) - 	The a) c)	number of µ 2 3	possible plastic	hinges fo b d	or a))	a propped cantilever l 1 zero	beam is	
8	3) - -	The subj	length of the	e plastic hinge central point loa	for a sim	ply ctar	supported beam of s	ipan L	

2L/3

none of the above

b)

d)

a)

C)

L/3

L/2

- 9) Design of beam is governed by shear _____.
 - a) When the depth of the beam section is small
 - b) when the large concentrated loads are placed near beam supports
 - c) both a & b
 - d) none of the above is correct
- 10) The thickness of battens flat should not be less than _____.
 - a) 1/30th length between inner line of rivets
 - b) 1/40th length between inner line of rivets
 - c) 1/50th length between inner line of rivets
 - d) 1/60th length between inner line of rivets
- 11) The collapse load for a cantilever beam of span I subjected to uniformly distributed load is _____.

a) 0.414 Mp/l

- b) 7.67 Mp/l
- c) 11.656 Mp/l d) none of the above
- 12) The thickness of base plate s determined from the _____.
 - a) flexural strength of the plate
 - b) shear strength of plate
 - c) bearing strength of concrete pedestal
 - d) punching criteria
- 13) The best arrangement to provide unified behavior in built up steel column is by _____.
 - a) lacing

- b) battening
- c) tie plates d) perforated cover plates
- 14) The partial safety factors for dead load and live load for a roof truss for limit state of serviceability respectively _____.
 - a) 1 and 1.5

C)

1.0 and 1.0

- b) 1.2 and 1.0
- d) 1.2 and 1.5

SLR-FM-632

Set R

Seat	
No.	

Set R

Max. Marks: 56

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF STEEL STRUCTURES

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gussetO9 plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- a) Salient features of limit state method of design of steel structures.
- b) Advantages and disadvantages of welded connection over bolted connection.
- c) Behaviour of bolted joints.

Section – II

- Q.6 A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mmc/c spacing of beams = 3mImposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.

SLR-FM-632 Set R

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF STEEL STRUCTURES**

Day & Date: Friday, 06-12-2019

Time: 02:30 PM To 06:30 PM

Duration: 30 Minutes

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
 - 3) Use of scientific non programmable calculator is allowed.
 - 4) Figures to the right indicate full marks.
 - 5) Assume suitable data if necessary and mention it clearly before the Solution.

6) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The thickness of double flat lacing should not be less than .
 - 1/30th length between inner rivets a)
 - 1/40th length between inner rivets b)
 - 1/50th length between inner rivets c)
 - 1/60th length between inner rivets d)

The number of possible plastic hinges for a propped cantilever beam is . 2)

- a) 2 b) 1 c)
 - d)

3) The length of the plastic hinge for a simply supported beam of span L subjected to a central point load is of rectangular section.

a) L/3

3

- 2L/3 b)
- c) L/2
- d) none of the above
- 4) Design of beam is governed by shear _
 - a) When the depth of the beam section is small
 - when the large concentrated loads are placed near beam supports b)
 - both a & b c)
 - none of the above is correct d)
- 5) The thickness of battens flat should not be less than _____.
 - 1/30th length between inner line of rivets a)
 - 1/40th length between inner line of rivets b)
 - 1/50th length between inner line of rivets C)
 - 1/60th length between inner line of rivets d)
- 6) The collapse load for a cantilever beam of span I subjected to uniformly distributed load is .
 - a) 0.414 Mp/l

- b) 7.67 Mp/I d) none of the above
- c) 11.656 Mp/I
- 7) The thickness of base plate s determined from the .
 - flexural strength of the plate a)
 - shear strength of plate b)
 - c) bearing strength of concrete pedestal
 - punching criteria d)

Set

Max. Marks: 70

- zero

8) The best arrangement to provide unified behavior in built up steel column is by ___ . a) lacing b) battening perforated cover plates c) tie plates d) The partial safety factors for dead load and live load for a roof truss for 9) limit state of serviceability respectively _ 1 and 1.5 b) 1.2 and 1.0 a) 1.0 and 1.0 d) 1.2 and 1.5 c) The economical spacing of a roof truss depends upon the _____. 10) a) cost of purlin and cost of roof covering cost of roof covering and dead load of the roof truss b) dead load and live loads C) d) live loads and cost of purlin A gusset plate is subjected to _____. 11) a) direct stress b) shear stress bending stress all of the above d) C) A beam section is selected and provided on the basis of _____. 12) a) section modulus b) deflection all of the above shear c) d) 13) The shear lag effect in beam flanges are disregarded when the outstand of the beam flange is less than or equal to Lo/10 a) Lo/15 b) c) Lo/20 d) Lo 14) Battening is preferred when the _ .

- column carries axial load only a)
- space between two main components is not very large b)
- both a & b c)
- none of the above d)

- Set S

SLR-FM-632

Seat	
No.	



T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF STEEL STRUCTURES

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q. No. 4 is compulsory and attempt any two from Section – I.

- 2) Q. No. 7 is compulsory and attempt any two from Section II.
- 3) Use of IS 800-2007 and IS 875 are allowed, but not allowed for MCQ (Q. No. 1)
- 4) Use of scientific non programmable calculator is allowed.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable data if necessary and mention it clearly before the Solution.
- 7) Draw the appropriate sketches whenever necessary.

Section – I

- Q.2 Determine the tensile strength of an ISMC 175 when it is connected to gusset09 plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm.
- Q.3 Design single angle section to carry a axial compression of 90KN. The centre to centre distance between end connection is 2.1m. Assume end connection is done by at least two bolts. Design end connection also.
- Q.4 Design a built up column with channel back to back to carry an axial factored load of 2100KN. The column has unsupported length of 7m and is effectively held in position at both ends but restrained against rotation at one end only. Design the suitable lacing system for the same.

Q.5 Attempt the following.

- a) Salient features of limit state method of design of steel structures.
- b) Advantages and disadvantages of welded connection over bolted connection.
- c) Behaviour of bolted joints.

Section – II

- Q.6 A fixed beam of 6m carries a uniformly distributed load of 60 KN/m on right hand 4.5m. The load factor is 1.15, yield stress is 23.2 KN/m², calculate the section modulus of the beam and locate the position of plastic hinges.
- Q.7 Design steel beam section for supporting roof of a big hall for the following data 10 and apply the usual checks. Assume steel grade Fe410.

Clear span = 6.5mEnd bearing = 150mmc/c spacing of beams = 3mImposed load on beam = 10 KN/m^2 Dead load = 4 KN/m^2 Restriction on beam depth 375mm

The compression flange of the beam is laterally supported throughout.

SLR-FM-632 Set S

- Q.8 Design I section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m apart over roof trusses spaced 5m centre to centre. The roof surface has inclination of 30° to the horizontal. The weight of corrugated iron sheet is 0.133KN/m², the weight of fixtures is 0.05KN/m². The design wind pressure for medium permeability is 1.25KN/m²(outward) parallel to the ridge.
- Q.9 Design gusseted base for built up column consisting of 2nos ISMB 400 at a c/c 09 distance of 300mm. It carries axial load of 1200KN. Use M20 grade of concrete for pedestal.

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering GEOTECHNICAL ENGINEERING - I** Day & Date: Monday, 09-12-2019 Max. Marks: 70 Time: 02:30 PM To 05:30 PM Instructions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Figures to the right indicate full marks. MCQ/Objective Type Questions **Duration: 30 Minutes** Choose the correct alternatives from the options and rewrite the sentence. If solid portion and void portion in a given mass of soil is same then porosity for this soil is _____. a) 1 b) 0.75 0.50 d) 0.25 c) Which factors do not affect the permeability of soil Size of soil particle Shape of soil particle b) a) Specific gravity d) Porosity C) Optimum moisture content of which soil is more at a given compaction effort Silt a) b) Clay

d) Sandy clay c) Sand

4) Which roller is most suitable for compacting clayey soil?

- Pneumatic b) Vibratory a)
- Sheep foot d) smooth wheel c)
- Coefficient of volume compressibility is the slope of which of following 5) curve
 - a) e - p curve b) e - log p curve
 - None of these c) flow curve d)
- If the soil is dry then percentage air void for this soil is _____. 6)
 - a) 1 b) 0
 - c) 0.50 d) None of these
- 7) Permeability of the soil is more when the degree of saturation of soil is ____.
 - 0% 25% a) b) c) d) 100% 50%
- In compaction test graph is plotted between water content and 8) density of soil.
 - Bulk a)
 - c) Dry

Seat

No.

Q.1

1)

2)

3)

- b) Submerged
- Soil solid d)

SLR-FM-633



Marks: 14 14

				SLR-FM-633
				Set P
9)	Proc	cess of removal of water from the	soil is	called
	a)	compaction	b)	consolidation
	c)	compression	d)	none of these
10)	Grap	phical method for finding earth pr	essure	e is given by
	a)	Terzaghi	b)	Cassagrande
	c)	Boussinesq	d)	Culman
11)	Van	e shear test is commonly used to	find s	hear strength of soil.
	a)	Clayey	b)	Sandy
	c)	Silty	d)	Soft clayey soil
12)	Heig	ght of fall of rammer in modified c	ompao	ction test is
	a)	250mm	b)	310mm
	c)	400mm	d)	450mm
13)	Whie	ch of following shear strength tes	t is qu	ick one?
	a)	UU test	b)	CU test
	c)	CD test	d)	None of these
14)	Star test	ndard size of soil sample used for is	cond	ucting unconfined compression
	a)	30mm dia. and 60mm height	d)	38mm dia. and 76mm height

- c) 50 cm dia and 100 cm length d) 10 cm dia and 20 cm length

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

GEOTECHNICAL ENGINEERING - I

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- a) Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- **b)** Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - b) A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- **Q.4 a)** What is permeability of soil? Explain any four factors affecting permeability **05** of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?

b) Consolidated undrained test were carried out on a soil sample and **05** following observations were recorded.

Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

SLR-FM-633

Max. Marks: 56

05

05

Section – II

Q.6 Answer any four questions:

- Define Maximum dry density and optimum moisture content. a)
- Define over-consolidation ratio and how it is used to classify the soil. b)
- Draw compaction curve along with zero air void line (label all parts). c)
- Draw typical e p curve and label various parts of it. d)
- Write any four analogy between spring model and saturated soil e) (consolidation).
- Q.7 Explain step wise procedure for field compaction of soil. a)
 - The following are the results of a standard compaction test performed on a b) 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- Plot compaction curve and hence find OMC and MDD 1)
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- Q.8 a) Explain e- log p curve and derive the coefficient associated with it.
 - A clay specimen was tested in a laboratory consolidation device, which 05 b) was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m 1) thickness where only the top layer is drained
 - Time for 90% consolidation in the field with this soil with a 2.5 m 2) thickness where only the top layer is drained
- Q.9 Enlist the assumptions of Rankine's Theory of earth pressure. a)
 - Calculate total active earth pressure and its position with respect to bottom 05 b) of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having $\Upsilon = 18$ kN/m³, c = 0 and $\varphi = 27^{0}$ followed by second layer having Υ =19kN/m³, c = 0 and φ = 30⁰.

80

05

05

SLR-FM-633

Set

			GEOTECHNICAL EN		ig EERING - I	
Day	& Date	e: Mo	nday, 09-12-2019		Max. Marks	s: 70
l ime	9:02:30			ماما ا	actual in first 20 minutes in any	
Inst	ruction	15: 1)	book	na pe	solved in first 30 minutes in ans	wer
		2)	Figures to the right indicate full n	narks.		
		,	MCQ/Objective Tvr	be Qu	estions	
Dura	ation: 3	0 Mir	nutes		Marks	s: 14
Q.1	Choo	ose tl	ne correct alternatives from the	optio	ons and rewrite the sentence.	14
	1)	In c dens	ompaction test graph is plotted sity of soil.	betw	veen water content and	
		c)	Dry	d)	Soil solid	
	2)	Proc	cess of removal of water from the	soil is	s called	
		a) c)	compaction	d)	none of these	
	3)	Grap	phical method for finding earth pre	essure	e is given by	
		a) c)	l erzaghi Boussinesq	b) d)	Cassagrande Culman	
	4)	Van	e shear test is commonly used to	find s	hear strength of soil.	
		a) c)	Silty	b) d)	Sandy Soft clayey soil	
	5)	Heig	ht of fall of rammer in modified co	ompa	ction test is	
		a) c)	250mm 400mm	b) d)	310mm 450mm	
	6)	Whi	ch of following shear strength test	is au	ick one?	
	-)	a)	UU test	b)	CU test	
		c)	CD test	d)	None of these	
	7)	Star test	dard size of soil sample used for is	cond	ucting unconfined compression	
		a) c)	30mm dia. and 60mm height 50 cm dia and 100 cm length	b) d)	38mm dia. and 76mm height 10 cm dia and 20 cm length	
	8)	lf so poro	lid portion and void portion in a gi sity for this soil is	ven n	nass of soil is same then	
		a) c)	1 0.50	b) d)	0.75 0.25	
	9)	Whi	ch factors do not affect the perme	ability	/ of soil	
		a)	Shape of soil particle	b)	Size of soil particle	
		C)	Specific gravity	d)	Porosity	

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

Seat No. SLR-FM-633

Set Q

10) Optimum moisture content of which soil is more at a given compaction effort ____•

- Silt a) C) Sand
- Clay b)

d) Sandy clay **SLR-FM-633**

Set | Q

- Which roller is most suitable for compacting clayey soil? 11)
 - a) Pneumatic b) Vibratory
 - d) C) Sheep foot smooth wheel
- Coefficient of volume compressibility is the slope of which of following 12) curve _____.
 - e log p curve a) e - p curve b)
 - d) None of these C) flow curve
- If the soil is dry then percentage air void for this soil is _____. 13)
 - a) 1 b) 0
 - d) C) 0.50 None of these
- 14) Permeability of the soil is more when the degree of saturation of soil is ___.
 - a) 0% b) C)
 - 50%

25% 100% d)

05

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- a) Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- b) Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - b) A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- **Q.4 a)** What is permeability of soil? Explain any four factors affecting permeability **05** of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?

b) Consolidated undrained test were carried out on a soil sample and 05 following observations were recorded.

<u> </u>		
Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

any two

Max. Marks: 56

SLR-FM-633



05

Section – II

Q.6 Answer any four questions:

- Define Maximum dry density and optimum moisture content. a)
- Define over-consolidation ratio and how it is used to classify the soil. b)
- Draw compaction curve along with zero air void line (label all parts). c)
- Draw typical e p curve and label various parts of it. d)
- Write any four analogy between spring model and saturated soil e) (consolidation).
- Q.7 Explain step wise procedure for field compaction of soil. a)
 - The following are the results of a standard compaction test performed on a b) 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- Plot compaction curve and hence find OMC and MDD 1)
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- Q.8 a) Explain e- log p curve and derive the coefficient associated with it.
 - A clay specimen was tested in a laboratory consolidation device, which 05 b) was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m 1) thickness where only the top layer is drained
 - Time for 90% consolidation in the field with this soil with a 2.5 m 2) thickness where only the top layer is drained
- Q.9 Enlist the assumptions of Rankine's Theory of earth pressure. a)
 - Calculate total active earth pressure and its position with respect to bottom 05 b) of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having $\Upsilon = 18$ kN/m³, c = 0 and $\varphi = 27^{0}$ followed by second layer having $\Upsilon = 19$ kN/m³, c = 0 and $\varphi = 30^{\circ}$.

80

05

Set Q

SLR-FM-633

05

		GEO	IECHNICAL EN	GINI	EERING - I	
Day Time	& Date : 02:3	e: Monday, 09-12-20 0 PM To 05:30 PM	019		Max. Marks: 7	7 0
Insti	uctio	ns:1) Q. No. 1 is co book. 2) Figures to the	mpulsory and shoul	d be	solved in first 30 minutes in answe	r
				aiks.		
Dura	tion: 3	N Minutes	ICQ/Objective Type	e Que	estions Marks: 1	۱۵
0 1	Cho	ose the correct alte	ernatives from the	ontio	ins and rewrite the sentence 1	۱۵
<u> </u>	1)	Coefficient of volur curve	ne compressibility is	the	slope of which of following	
		a) e - p curve c) flow curve		b) d)	e - log p curve None of these	
	2)	If the soil is dry the	en percentage air voi	d for	this soil is	
		a) 1 c) 0.50		b) d)	0 None of these	
	3)	Permeability of the a) 0% c) 50%	soil is more when th	ne de b) d)	gree of saturation of soil is 25% 100%	
	4)	In compaction tes density of soil. a) Bulk c) Dry	t graph is plotted	betwe b) d)	een water content and Submerged Soil solid	
	5)	Process of remova a) compaction c) compression	I of water from the s	oil is b) d)	called consolidation none of these	
	6)	Graphical method f a) Terzaghi c) Boussinesq	for finding earth pres	ssure b) d)	is given by Cassagrande Culman	
	7)	Vane shear test is a) Clayey c) Silty	commonly used to f	ind sl b) d)	hear strength of soil. Sandy Soft clayey soil	
	8)	Height of fall of ran a) 250mm c) 400mm	nmer in modified cor	npac b) d)	tion test is 310mm 450mm	
	9)	Which of following a) UU test c) CD test	shear strength test i	s qui b) d)	ck one? CU test None of these	
	10)	Standard size of so test is a) 30mm dia. an	oil sample used for o nd 60mm height	ondu b)	icting unconfined compression 38mm dia. and 76mm height	

50 cm dia and 100 cm length

C)

Seat

No.

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Čivil Engineering**

Page **9** of **16**

10 cm dia and 20 cm length

d)

SLR-FM-633

Set R

11) If solid portion and void portion in a given mass of soil is same then porosity for this soil is _____.

- a) 1 b) 0.75 c) 0.50 d) 0.25
- 12) Which factors do not affect the permeability of soil ____
 - Shape of soil particle b) Size of soil particle
 - c) Specific gravity d) Porosity
- 13) Optimum moisture content of which soil is more at a given compaction effort _____.
 - a) Silt b)
 - c) Sand d) Sandy clay
- 14) Which roller is most suitable for compacting clayey soil?
 - a) Pneumatic

a)

b) Vibratory

Clay

c) Sheep foot

d) smooth wheel

_.

SLR-FM-633

Set | R

05

Set

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- a) Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- b) Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - b) A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- **Q.4 a)** What is permeability of soil? Explain any four factors affecting permeability **05** of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?

b) Consolidated undrained test were carried out on a soil sample and 05 following observations were recorded.

Т	est	Cell pressure (kPa)	Deviator stress at failure (kPa)
1		250	179
2	2	350	242
_			

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

08

05

Max. Marks: 56

SLR-FM-633

Section – II

Q.6 Answer any four questions:

- Define Maximum dry density and optimum moisture content. a)
- Define over-consolidation ratio and how it is used to classify the soil. b)
- Draw compaction curve along with zero air void line (label all parts). c)
- Draw typical e p curve and label various parts of it. d)
- Write any four analogy between spring model and saturated soil e) (consolidation).
- Q.7 Explain step wise procedure for field compaction of soil. a)
 - The following are the results of a standard compaction test performed on a b) 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- Plot compaction curve and hence find OMC and MDD 1)
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- Q.8 a) Explain e- log p curve and derive the coefficient associated with it.
 - A clay specimen was tested in a laboratory consolidation device, which 05 b) was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m 1) thickness where only the top layer is drained
 - Time for 90% consolidation in the field with this soil with a 2.5 m 2) thickness where only the top layer is drained
- Q.9 Enlist the assumptions of Rankine's Theory of earth pressure. a)
 - Calculate total active earth pressure and its position with respect to bottom 05 b) of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having $\Upsilon = 18$ kN/m³, c = 0 and $\varphi = 27^{0}$ followed by second layer having $\Upsilon = 19$ kN/m³, c = 0 and $\varphi = 30^{\circ}$.

80

05

05

Set R

SLR-FM-633
		T.E	. (Part - I) (Old) (CGPA) Ex	amin	ation Nov/Dec-2019
			GEOTECHNICAL E	eerin NGIN	ig EERING - I
Day Time	& Date : 02:3	T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING - I Date: Monday, 09-12-2019 Max. Marks: 70 02:30 PM To 05:30 PM Max. Marks: 70 ctions:1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Figures to the right indicate full marks. MCQ/Objective Type Questions Marks: 14 Choose the correct alternatives from the options and rewrite the sentence. 14 1) Graphical method for finding earth pressure is given by			
Instr	uctio	n s: 1)	Q. No. 1 is compulsory and sho book.	uld be	solved in first 30 minutes in answer
		2)	Figures to the right indicate full r	narks.	
D			MCQ/Objective Ty	pe Qu	estions
Dura	tion: 3		nutes	onti	Marks: 14
Q.1	1)	Grap Grap a) c)	bhical method for finding earth pr Terzaghi Boussinesq	essure b) d)	e is given by Cassagrande Culman
	2)	Vano a) c)	e shear test is commonly used to Clayey Silty	find s b) d)	hear strength of soil. Sandy Soft clayey soil
	3)	Heig a) c)	ht of fall of rammer in modified c 250mm 400mm	ompao b) d)	ction test is 310mm 450mm
	4)	Whio a) c)	ch of following shear strength tes UU test CD test	t is qu b) d)	ick one? CU test None of these
	5)	Stan	idard size of soil sample used for	cond	ucting unconfined compression
		test a) c)	is 30mm dia. and 60mm height 50 cm dia and 100 cm length	b) d)	38mm dia. and 76mm height 10 cm dia and 20 cm length
	6)	lf so poro a) c)	lid portion and void portion in a g sity for this soil is 1 0.50	iven m b) d)	nass of soil is same then 0.75 0.25
	7)	Whice a) c)	ch factors do not affect the perme Shape of soil particle Specific gravity	eability b) d)	/ of soil Size of soil particle Porosity
	8)	Opti effor a) c)	mum moisture content of which s t Silt Sand	oil is r b) d)	more at a given compaction Clay Sandy clay
	9)	Whic a) c)	ch roller is most suitable for comp Pneumatic Sheep foot	bacting b) d)	g clayey soil? Vibratory smooth wheel

Seat

No.

Set S

SLR-FM-633

10) Coefficient of volume compressibility is the slope of which of following curve _____. e - log p curve a) e - p curve b)

- d) C) flow curve
 - None of these
- If the soil is dry then percentage air void for this soil is _____. 11)
 - a) b) 1 0 C)
 - 0.50 d) None of these
- Permeability of the soil is more when the degree of saturation of soil is ___. 12) 0% a)
 - b) 25%
 - C) 50% d) 100%
- 13) In compaction test graph is plotted between water content and _____ density of soil.
 - Bulk b) Submerged
 - Soil solid Dry d) c)
- Process of removal of water from the soil is called _____ 14)
 - compaction a)

a)

consolidation b)

SLR-FM-633

Set S

C) compression d) none of these

05

Set

T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering GEOTECHNICAL ENGINEERING - I

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q N 2 is compulsory and Q N 6 is compulsory and attempt any two question from each section.

- 2) Reinforce your answer with illustrative sketches where-ever possible.
- 3) Assume suitable data if required
- 4) Do write units for the calculated quantities.

Section - I

Q.2 Answer any four questions:

- a) Draw grain size distribution curve and show D_{10} , D_{30} and D_{60} on it.
- b) Name two soil belonging to Fine grained soil and that belonging to coarse grained soil.
- c) Define air content and degree of saturation.
- d) Draw labelled sketch of triaxial shear apparatus (minimum four parts labeled).
- e) Draw graph used to calculate liquid limit for soil and show liquid limit on it.
- **Q.3** a) With suitable notation prove the relation $e = \frac{wG}{S_r}$
 - b) A soil sample has equal amounts of voids and solids, and also amount of **05** air and water in terms of volume is same; for this soil find
 - 1) void ratio of the soil
 - 2) porosity
 - 3) air content
 - 4) % air void and
 - 5) degree of saturation
- **Q.4 a)** What is permeability of soil? Explain any four factors affecting permeability **05** of soil.
 - b) Soil strata of 3 layers of thickness 1, 1.5, and 2.0 m having the coefficient 05 permeability of 2X10⁻³, 1.5X10⁻³ and 3X10⁻³ cm/s respectively. Estimate the average coefficient of permeability in the direction of
 - 1) Parallel to the bedding plane
 - 2) Normal to the bedding plane
- **Q.5** a) What are different types of shear test based on drainage of soil?

b) Consolidated undrained test were carried out on a soil sample and 05 following observations were recorded.

Test	Cell pressure (kPa)	Deviator stress at failure (kPa)
1	250	179
2	350	242

Determine shear parameters of soil both in terms of total stress and effective stress, if another identical soil specimen was tested at a cell pressure of 400kPa, what would be deviator stress at failure.

08

05

Max. Marks: 56

SLR-FM-633

Section – II

Q.6 Answer any four questions:

- Define Maximum dry density and optimum moisture content. a)
- Define over-consolidation ratio and how it is used to classify the soil. b)
- Draw compaction curve along with zero air void line (label all parts). c)
- Draw typical e p curve and label various parts of it. d)
- Write any four analogy between spring model and saturated soil e) (consolidation).
- Q.7 Explain step wise procedure for field compaction of soil. a)
 - The following are the results of a standard compaction test performed on a b) 05 sample of soil.

Moisture content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.05	1.99	1.96	1.92

- Plot compaction curve and hence find OMC and MDD 1)
- 2) Plot 10% air void line
- 3) What is the air content and degree of saturation corresponding to MDD?
- Q.8 a) Explain e- log p curve and derive the coefficient associated with it.
 - A clay specimen was tested in a laboratory consolidation device, which 05 b) was 12.7 mm thick and the top and the bottom boundaries were drained. A 50% consolidation time on the specimen was obtained as 28.4 minutes. Determine the following:
 - Time for 50% consolidation in the field with this soil with a 2.5 m 1) thickness where only the top layer is drained
 - Time for 90% consolidation in the field with this soil with a 2.5 m 2) thickness where only the top layer is drained
- Q.9 Enlist the assumptions of Rankine's Theory of earth pressure. a)
 - Calculate total active earth pressure and its position with respect to bottom 05 b) of wall acting on a retaining wall of height 9m retaining two layered soil on back side of it. Top layer 4.2m thick having $\Upsilon = 18$ kN/m³, c = 0 and $\varphi = 27^{0}$ followed by second layer having $\Upsilon = 19$ kN/m³, c = 0 and $\varphi = 30^{\circ}$.

80

05

05

Set S

SLR-FM-633

Set

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – I**

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

1)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Acidity in water is caused due to
 - Mineral acids Iron sulphate a) b) c) Free CO₂ d) All of the above
- 2) Turbidity of raw water is a measure of
 - Suspended solids a) b) B. O. D. Acidity of water d) None of these c)
- Hardness of water is caused due to 3)
 - Calcium sulphate b) Calcium Nitrates a)
 - Magnesium sulphate None of the above d) C)
- 4) Mostly used coagulant, is ____ Chlorine b) Lime a)
 - c) Alum d) **Bleaching Powder**

5) Aeration process is useful for the removal of _

- Odour Suspended solids a) b) Total solids d) All of the above c) 6) Carbonates in water produce ____
 - a) temporary hardness b) permanent hardness acidity c) d) Alkanity
- is determined by titrating with standard EDTA solution & 7) Eriochrome black T- indicator.
 - Nitrates a) Chlorides d) Turbidity c)
- For a city developed haphazardly, the layout of distribution pipes preferred 8) to, is
 - Radial system a) b) Ring system Dead end system d) Iron grid system c)
- 9) Water losses in water supply is assumed as _____
 - Test pressure a)
 - b) Working pressure c) Pipe pressure d) Design pressure

SLR-FM-634

Max. Marks: 70

Marks: 14

- b) Hardness

is the pipe connecting to storage tank various fixtures and taps. 10)

- Distributing pipe a)
- b) Supply pipe

SLR-FM-634

Set

- Antisiphonage pipe c)
- d) Service pipe
- 11) _ can follow direct routes and require shorter length of conduits.
 - a) Gravity conduit
 - b) Aqueduct d) Pressure conduits
- 12) To control the wastage of water ____ measures are taken.
 - Pipe joints b) Water taps a)
 - Zoning system C)
 - All of the above d)
- 13) Generally _____ supply will reduce.
 - Continuous a)

Tunnels

C)

- Intermittent b)
- c) Both a) and b) d)
- 14) Analysis of pipe networks of distribution system is calculated by _
 - a) Discharge in pipelines
- b) Equivalent pipe method
- Computation of pressure c)
- d) Mass curve method

None of these

09

		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering	
		ENVIRONMENTAL ENGINEERING – I	
Day Time	& Da e 02:3	ate: Wednesday, 11-12-2019 Max. Marks 30 PM To 05:30 PM	: 56
Instr	ructio	 ons: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two from the remaining questions from each section. 3) Figure to the right indicates full marks 4) Assume suitable data wherever required and mention it clearly. 5) Use of non – programmable calculator is allowed. 	
	_	Section – I	
Q.2	a) b)	 Write the values of drinking water standards. 1) pH 2) Akalinty 3) Hardness 4) Turbidity 5) Colour 6) Chlorides Population of 5 decades is given below: 	03 07
		Teal13001370130013002000Population3500038000400004200049000Determine the population in year 2020 by geometrical increase methodand incremental increase method.	
Q.3	a) b)	Which equation to be used to find settling velocity? Derive the formula for the same.	04 05
	IJ	 percentage of particles of diameter. 0.06mm and 0.03mm will be removed in this tank? Temperature of water is 27°C and Sp. Gr. of particle are 2.65. 	UU
Q.4	a)	Differentiate slow sand and rapid sand filter with respect to following points.	03
	b)	Design a Floculator for a flow of $/$ MLD. Assume suitable data.	06

- Q.5 Write a short note on (any three)a) Chemistry of chlorination

 - Zeolite method b)
 - Coagulation C)
 - Aeration d)

SLR-FM-634

Seat No.





Set P

Section - II

- Q.6 a) Explain with neat sketch dead end system of distribution system. 05 05
 - Give drawbacks of intermittent system. b)
- Q.7 Explain the analytical method of fixing the capacity of service reservoir. 03 a) 06
 - Calculate discharge through various pipes using Hardy cross method if the b) K values in the expression for loss head $h_f = kQ^2$, & AB, BC, AC, AD, DC are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- Q.8 Enumerate various corrosion control methods. a)
 - Find the equivalent of 30cm equivalent diameter pipe of the network b) shown below by
 - **Darcy Weisbach equation** 1)
 - Hazen William's formula 2)

Note: L₁, L₂, L₃ are lengths & D₁, D₂, D₃ are diameters.



- Q.9 Write short notes on any three of the following:
 - Check valve a)
 - Advantages of pressurized water supply system b)
 - Water meter c)
 - Fire demand d)

09

04

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

ENVIRONMENTAL ENGINEERING – I

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

4)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

For a city developed haphazardly, the layout of distribution pipes preferred 1)

b)

- to, is _
- a) Radial system
- Dead end system C)
- 2) Water losses in water supply is assumed as b) Working pressure
 - Test pressure a)
 - C) Pipe pressure
- d) Design pressure

Ring system d) Iron grid system

- 3) is the pipe connecting to storage tank various fixtures and taps.
 - Distributing pipe a) Antisiphonage pipe c)
- b) Supply pipe d) Service pipe
- can follow direct routes and require shorter length of conduits.
- b) Aqueduct Gravity conduit a)
 - Tunnels d) Pressure conduits c)
- To control the wastage of water 5) measures are taken.
 - Pipe joints b) Water taps a)
 - d) All of the above Zoning system C)
- Generally _____ supply will reduce. 6)
 - Continuous b) Intermittent a)
 - Both a) and b) d) None of these C)
- 7) Analysis of pipe networks of distribution system is calculated by
 - Discharge in pipelines a) c)
- b) Equivalent pipe method Computation of pressure d) Mass curve method
- Acidity in water is caused due to 8)
 - a) Mineral acids b) Iron sulphate All of the above c) Free CO₂ d)
- 9) Turbidity of raw water is a measure of
 - b) B.O.D. Suspended solids a)
 - c) Acidity of water d) None of these
- Hardness of water is caused due to _ 10)
 - Calcium sulphate a) c) Magnesium sulphate
- b) Calcium Nitrates
- d) None of the above

SLR-FM-634



Max. Marks: 70

Marks: 14

SLR-FM-634 Set Q

- 11) Mostly used coagulant, is _____.
 - a) Chlorine
 - c) Alum d) Bleaching Powder
- 12) Aeration process is useful for the removal of _____.
 - a) Odour
- b) Suspended solids
- d) All of the above
- 13) Carbonates in water produce _____a) temporary hardness

Total solids

- b) permanent hardness
- d) Alkanity

b) Lime

- 14) _____ is determined by titrating with standard EDTA solution & Eriochrome black T- indicator.
 - a) Nitrates

c) acidity

c)

c) Chlorides

- b) Hardness
- d) Turbidity

09

No.									JCI	¥
		T.E. (Part –	I) (Olo	d) (CGP	A) Exai	ninatio	n Nov/D	ec-2019		
		EN	VIROI	NMENI	AL EN	GINEEP	KING – I			
Day &	& Da	te: Wednesday,	11-12-2	2019				Max.	Marks	s: 56
Time	02:3		-101							
Instru	uctic	ons: 1) Q. No. 2	and Q.	No. 6 are	e compuls	sory.				
	2) Solve any two from the remaining questions from each section.									
	3) Figure to the right indicates full marks									
		4) Assume		e dala wh	blo colou	quirea ai	na menuoi Ilowod	n it cleany.		
		5) 056 01 10	m - prc	Jyrannia		1a101 15 a1	loweu.			
-				5	ection –					
Q.2	a)	Write the value	s of dri	nking wa	ter standa	ards.				03
		1) pH								
		2) Akalinty								
		3) Haroness								
		5) Colour								
		6) Chlorides								
	b)	Population of 5	decad	es is aive	n below:					07
	~,	Voor		1060	1070	1080	1000	2000		•
		Popul	ation	35000	38000	1900	1990	2000		
							+2000		ما	
		Determine the	populat	ion in yea	ar 2020 D od	y geome	trical incre	ease metho	a	
		and incrementa		ase meth	00.					
Q.3	a)	Which equation	to be i	used to fi	nd settlin	a velocitv	/? Derive	the formula	for	04

- Which equation to be used to find settling velocity? Derive the formula for 04 a) ... the same.
 - A settling tank is designed for an overflow rate of 6000 lit/m²/hr. What 05 b) percentage of particles of diameter.
 - 1) 0.06mm and
 - 2) 0.03mm will be removed in this tank?

Temperature of water is 27°C and Sp. Gr. of particle are 2.65.

- Differentiate slow sand and rapid sand filter with respect to following Q.4 03 a) points. 06
 - Design a Flocullator for a flow of 7 MLD. Assume suitable data. b)

Q.5 Write a short note on (any three)

- Chemistry of chlorination a)
- Zeolite method b)
- Coagulation c)
- d) Aeration

Seat

SLR-FM-634

Sot O

Set Q

Section - II

- Q.6 a) Explain with neat sketch dead end system of distribution system. 05 05
 - Give drawbacks of intermittent system. b)
- Q.7 Explain the analytical method of fixing the capacity of service reservoir. 03 a) 06
 - Calculate discharge through various pipes using Hardy cross method if the b) K values in the expression for loss head $h_f = kQ^2$, & AB, BC, AC, AD, DC are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- Q.8 Enumerate various corrosion control methods. a)
 - Find the equivalent of 30cm equivalent diameter pipe of the network b) shown below by
 - **Darcy Weisbach equation** 1)
 - Hazen William's formula 2)

Note: L₁, L₂, L₃ are lengths & D₁, D₂, D₃ are diameters.



- Q.9 Write short notes on any three of the following:
 - Check valve a)
 - Advantages of pressurized water supply system b)
 - Water meter c)
 - Fire demand d)

09

04

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

ENVIRONMENTAL ENGINEERING – I

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Aeration process is useful for the removal of . 1)
 - b) Suspended solids a) Odour c) Total solids
 - d) All of the above
- 2) Carbonates in water produce ____
 - a) temporary hardness b) permanent hardness
 - acidity c) d) Alkanity
- is determined by titrating with standard EDTA solution & 3) Eriochrome black T- indicator.
 - Nitrates b) Hardness a)
 - Chlorides d) Turbidity c)
- 4) For a city developed haphazardly, the layout of distribution pipes preferred to, is .
 - a) Radial system
 - **Ring system** b) c) Dead end system d) Iron grid system
- 5) Water losses in water supply is assumed as _
 - a) Test pressure b) Working pressure d) Design pressure
 - c) Pipe pressure
- 6) is the pipe connecting to storage tank various fixtures and taps.
 - a) Distributing pipe c) Antisiphonage pipe

a)

- b) Supply pipe d) Service pipe
- 7) _ can follow direct routes and require shorter length of conduits.
 - Gravity conduit b) Aqueduct d) Pressure conduits
 - Tunnels C)
- 8) To control the wastage of water measures are taken.
 - Pipe joints b) Water taps a)
 - d) All of the above Zoning system c)

9) Generally _____ supply will reduce.

- Continuous a)
- c) Both a) and b)
- b) Intermittent
- d) None of these

SLR-FM-634



Max. Marks: 70

Marks: 14

SLR-FM-0	634
Set	R

___.

- 10) Analysis of pipe networks of distribution system is calculated by _
 - a) Discharge in pipelines

Free CO₂

- b) Equivalent pipe method
- c) Computation of pressure
- d) Mass curve method
- computation of pressure
- Acidity in water is caused due to _____.
 - Mineral acids b) Iron sulphate
 - d) All of the above
- 12) Turbidity of raw water is a measure of _____
 - a) Suspended solids b) B. O. D.
 - c) Acidity of water d) None of these
- 13) Hardness of water is caused due to ____
 - a) Calcium sulphatec) Magnesium sulphate
- b) Calcium Nitrates
- d) None of the above
- 14) Mostly used coagulant, is _____.
 - a) Chlorine

11)

a)

c)

c) Alum

- b) Lime
- d) Bleaching Powder

06

09

No.		Jei R
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Day Time	& Da 9 02:3	e: Wednesday, 11-12-2019 Max. Marks: 56) PM To 05:30 PM
Instr	ructio	 ns: 1) Q. No. 2 and Q. No. 6 are compulsory. 2) Solve any two from the remaining questions from each section. 3) Figure to the right indicates full marks 4) Assume suitable data wherever required and mention it clearly. 5) Use of non – programmable calculator is allowed.
		Section – I
Q.2	a)	Write the values of drinking water standards. 03
		 pH Akalinty Hardness Turbidity Colour Chlorides
	b)	Population of 5 decades is given below: 07
		Year 1960 1970 1980 1990 2000
		Population 35000 38000 40000 42000 49000
		Determine the population in year 2020 by geometrical increase method and incremental increase method.
Q.3	a)	Which equation to be used to find settling velocity? Derive the formula for 04 the same.
	b)	 A settling tank is designed for an overflow rate of 6000 lit/m²/hr. What percentage of particles of diameter. 1) 0.06mm and 2) 0.03mm will be removed in this tank? Temperature of water is 27^oC and Sp. Gr. of particle are 2.65.
Q.4	a)	Differentiate slow sand and rapid sand filter with respect to following 03

Differentiate slow sand and rapid sand filter with respect to following Q.4 a) points.

Design a Flocullator for a flow of 7 MLD. Assume suitable data. b)

Write a short note on (any three) Q.5

- Chemistry of chlorination a)
- b) Zeolite method
- Coagulation c)
- Aeration d)

Set R

Seat

Set R

Section - II

- Q.6 a) Explain with neat sketch dead end system of distribution system. 05 05
 - Give drawbacks of intermittent system. b)
- Q.7 Explain the analytical method of fixing the capacity of service reservoir. 03 a) 06
 - Calculate discharge through various pipes using Hardy cross method if the b) K values in the expression for loss head $h_f = kQ^2$, & AB, BC, AC, AD, DC are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- Q.8 Enumerate various corrosion control methods. a)
 - Find the equivalent of 30cm equivalent diameter pipe of the network b) shown below by
 - Darcy Weisbach equation 1)
 - Hazen William's formula 2)

Note: L₁, L₂, L₃ are lengths & D₁, D₂, D₃ are diameters.



- Q.9 Write short notes on any three of the following:
 - Check valve a)
 - Advantages of pressurized water supply system b)
 - Water meter c)
 - Fire demand d)

09

04

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENVIRONMENTAL ENGINEERING – I**

Day & Date: Wednesday, 11-12-2019 Time 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever required and mention it clearly.
- 4) Use of non programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

1)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

_____ is the pipe connecting to storage tank various fixtures and taps.

- Distributing pipe a)
- b) Supply pipe
- Antisiphonage pipe d) Service pipe
- 2) can follow direct routes and require shorter length of conduits. b) Aqueduct
 - a) Gravity conduit Tunnels C)
- d) Pressure conduits
- 3) To control the wastage of water _____ measures are taken.
 - a) Pipe joints b) Water taps
 - c) Zoning system d) All of the above
- Generally _____ supply will reduce. 4)
 - a) Continuous b) Intermittent
 - Both a) and b) d) None of these c)
- 5) Analysis of pipe networks of distribution system is calculated by _
 - a) Discharge in pipelines b) Equivalent pipe method d) Mass curve method
 - Computation of pressure c)
- Acidity in water is caused due to 6) a) Mineral acids Iron sulphate b)
 - c) Free CO₂ d) All of the above
- Turbidity of raw water is a measure of _ 7) a) Suspended solids b) B.O.D.
 - c) Acidity of water d) None of these
- Hardness of water is caused due to 8)
 - a) Calcium sulphate b) Calcium Nitrates
 - Magnesium sulphate d) None of the above c)
- 9) Mostly used coagulant, is a) Chlorine b) Lime
 - **Bleaching Powder** C) Alum d)
- Aeration process is useful for the removal of _____ 10) Odour b) Suspended solids a)
 - c) Total solids d) All of the above



Max. Marks: 70

Marks: 14

- Carbonates in water produce _____ 11)
 - a) temporary hardness
- b) permanent hardness

Set S

- c) acidity d) Alkanity
- _____ is determined by titrating with standard EDTA solution & 12) Eriochrome black T- indicator. Nitrates a)
 - b) Hardness
 - Chlorides d) Turbidity c)
- For a city developed haphazardly, the layout of distribution pipes preferred 13) to, is ___ ____-•
 - a) Radial system

- b) Ring system
- d) Iron grid system c) Dead end system
- 14) Water losses in water supply is assumed as _
 - a) Test pressure

b) Working pressure

___.

- c) Pipe pressure
- d) Design pressure

09

No.		Jei 3
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
_	_	
Day & Time	& Dat 02:3	: Wednesday, 11-12-2019 Max. Marks: 56 PM To 05:30 PM
Instr	uctic	 (a) Solve and Q. No. 6 are compulsory. (a) Solve any two from the remaining questions from each section. (b) Figure to the right indicates full marks (c) Assume suitable data wherever required and mention it clearly. (c) Use of non – programmable calculator is allowed.
		Section – I
Q.2	a)	 Write the values of drinking water standards. 03 1) pH 2) Akalinty 3) Hardness 4) Turbidity 5) Colour 6) Chlorides
	b)	Population of 5 decades is given below: 07
		Year19601970198019902000Population3500038000400004200049000
		Determine the population in year 2020 by geometrical increase method and incremental increase method.
Q.3	a)	Which equation to be used to find settling velocity? Derive the formula for 04 the same.
	b)	A settling tank is designed for an overflow rate of 6000 lit/m ² /hr. What 05 percentage of particles of diameter.

- 1) 0.06mm and
- 2) 0.03mm will be removed in this tank?

Temperature of water is 27°C and Sp. Gr. of particle are 2.65.

- Differentiate slow sand and rapid sand filter with respect to following Q.4 a) 03 points. 06
 - Design a Flocullator for a flow of 7 MLD. Assume suitable data. b)

Q.5 Write a short note on (any three)

- Chemistry of chlorination a)
- Zeolite method b)
- Coagulation C)
- d) Aeration

Seat

SLR-FM-634

Set S

Set S

Section - II

- Q.6 a) Explain with neat sketch dead end system of distribution system. 05 05
 - Give drawbacks of intermittent system. b)
- Q.7 Explain the analytical method of fixing the capacity of service reservoir. 03 a) 06
 - Calculate discharge through various pipes using Hardy cross method if the b) K values in the expression for loss head $h_f = kQ^2$, & AB, BC, AC, AD, DC are 4,1,3,2 & 1 respectively, find discharge through each pipe & indicate direction of flow. Take two trials.



- Q.8 Enumerate various corrosion control methods. a)
 - Find the equivalent of 30cm equivalent diameter pipe of the network b) shown below by
 - Darcy Weisbach equation 1)
 - Hazen William's formula 2)

Note: L₁, L₂, L₃ are lengths & D₁, D₂, D₃ are diameters.



- Q.9 Write short notes on any three of the following:
 - Check valve a)
 - Advantages of pressurized water supply system b)
 - Water meter c)
 - Fire demand d)

09

04

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT – I**

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

C)

Seat

No.

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Acceptance quality level for inspection in stored normally range between 1)
 - a) 0 - 0.5%

20 - 50%

- b) 0.5 3%
- d) 50 100%
- Lead time is the time between _____. 2)
 - a) Order and receipt
 - Receipt of material and its consumption b)
 - C) Order and consumption
 - Dispatch and receipt d)

3) If 'h' is arrival rate 'w' is waiting time then expected no. of customer 'L' will be ____.

- b) $L = \lambda/w$ a) $L = \lambda w$
- c) $L = w / \lambda$ d) $L = w + \lambda$
- In a dustbin opening from top queue discipline is normally _____. 4)
 - a) FIFO b) LIFO c)
 - Random d) None of these
- The cost of keeping items in inventory is called _____. 5)
 - Set up cost b) Holding cost a) c)
 - Shortage cost d) None of these
- Moderate inventory control is sufficient for 6)
 - A class items b) B class items a)
 - C class items d) All of these c)
- 7) In Dynamic Programming Policy is defined as _____.
 - a) Point where decision is made
 - Information describing problem at each stage b)
 - C) Decision making rule
 - **Optimal policy** d)

a)

- 8) Hungerian trial and error method is suitable for solving _____
 - Transportation problem b) Assignment problem d) Decision tree
 - Two person zero sum game C)

Set

Max. Marks: 70

SLR-FM-635

9) The solution of decision tree is obtained by _____.

- a) Folding back method
- b) Games theory
- c) Laplace criteria
- d) Dynamic programming
- The biological process of mutation has inspired 10)
 - a) Artificial Neural Network
 - b) Fuzzy logic c) Genetic Algorithm d) Dynamic programming
- 11) Linear programming deals with the optimization of a function of variable is known as .
 - Subjective function a)
- b) Objective function
- Allocation of units is not dependent on transport cost in _____. 12)
 - VAM method a) Both of these

c) Both a) and b)

Constraints

C)

C)

- EOQ model helps to find _____. 13)

a) Optimum size of order

b) Time interval between order

.

- d) None of these
- Games without a saddle point require player to play 14)
 - Mixed strategies a)
- b) Pure strategies
- Dominated strategies c)
- d) None of these

Set

- b) NW corner method
- d) None of these
- d) All of these

SLR-FM-635

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT - I

Day & Date: Friday, 13-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figure to the right indicates full marks.

3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer any three

- a) Explain with example Formal and Informal organization.
- b) Find IBFS of the following transportation problem using Least Cost Method.

c) Certain equipment needs 5 repair jobs which have to be assigned to 5 machines. The estimated time in hours that each machine requires to complete the repair job is given in following table.

Assuming that each machine can be assigned one job, determine minimum time of assignment.

- d) Write notes on.
 - 1) Monte Carlo Simulation
 - 2) Queuing line theory

Supply 19 30 50 10 7 70 30 40 60 9 40 08 70 20 18 7 Demand 5 8 14

Job J1 J2 J3 J4 J5 Machine M1 7 5 9 8 11 M2 9 12 7 11 10 4 9 M3 8 5 6 M4 7 3 6 9 5 7 M5 4 6 5 11 24

Set

SLR-FM-635

Max. Marks: 56

e) Find the value of the game

Q.3 Write notes.

- a) Decision under uncertainty
- b) ANN

Section – II

Q.4 Answer any four

- a) Derive the formula for EOQ & explain each term.
- **b)** Explain the importance of ABC analysis with graph.
- c) What is BEP? How it is carried out? How it is used?
- d) Write a note on Quality control chart.
- e) Write note on Profit & loss account and Balance sheet.
- f) Write a note various types inventory cost.
- **g)** ABC corporation has got a demand for particular part at 10000 units per year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine
 - 1) EOQ
 - 2) Optimum number of orders to be placed per annum
 - 3) Total cost of inventory per annum.



SLR-FM-635 Set P

28

Set

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT – I**

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

C)

a)

a)

6)

7)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Hungerian trial and error method is suitable for solving _ 1)
 - a) Transportation problem
 - Two person zero sum game
- The solution of decision tree is obtained by _ 2)
 - Folding back method a)
 - Laplace criteria C)
- The biological process of mutation has inspired 3)
 - a) Artificial Neural Network
 - Genetic Algorithm C)
- Linear programming deals with the optimization of a function of variable is 4) known as .
 - Subjective function a)
 - Constraints
- Allocation of units is not dependent on transport cost in 5)
 - a) VAM method b) NW corner method
 - Both of these C)
- b) Time interval between order
- Both a) and b) C)

Mixed strategies

EOQ model helps to find _____. Optimum size of order

- Games without a saddle point require player to play _
 - b) Pure strategies
- Dominated strategies C)
- Acceptance quality level for inspection in stored normally range between 8)
 - 0 0.5% b) 0.5 - 3% a) d) 50 - 100% 20 - 50% C)
- Lead time is the time between _____. 9)
 - a) Order and receipt
 - Receipt of material and its consumption b)
 - Order and consumption c)
 - Dispatch and receipt d)



Max. Marks: 70

SLR-FM-635

- Marks: 14
- b) Assignment problem
- d) Decision tree
- b) Games theory
- d) Dynamic programming
- b) Fuzzy logic
- d) Dynamic programming
- - b) Objective function
 - d) All of these
 - d) None of these
- - d) None of these

d) None of these

10) If 'h' is arrival rate 'w' is waiting time then expected no. of customer 'L' will be _____.

SLR-FM-635

Set Q

- a) $L = \lambda w$ c) $L = w / \lambda$ b) $L = \lambda / w$ d) $L = w + \lambda$
- 11) In a dustbin opening from top queue discipline is normally _____.
 - a) FIFO b) LIFO
 - c) Random d) None of these
- 12) The cost of keeping items in inventory is called _____.
 - a) Set up cost b) Holding cost
 - c) Shortage cost d) None of these
- 13) Moderate inventory control is sufficient for ____
 - a) A class items b) B class items
 - c) C class items d) All of these
- 14) In Dynamic Programming Policy is defined as _____.
 - a) Point where decision is made
 - b) Information describing problem at each stage
 - c) Decision making rule
 - d) Optimal policy

Seat No.

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT - I

Day & Date: Friday, 13-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figure to the right indicates full marks.

3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer any three

- a) Explain with example Formal and Informal organization.
- **b)** Find IBFS of the following transportation problem using Least Cost Method.

c) Certain equipment needs 5 repair jobs which have to be assigned to 5 machines. The estimated time in hours that each machine requires to complete the repair job is given in following table.

Assuming that each machine can be assigned one job, determine minimum time of assignment.

- d) Write notes on.
 - 1) Monte Carlo Simulation
 - 2) Queuing line theory

Supply 10 7 19 30 50 60 9 70 30 40 40 08 70 20 18 7 Demand 5 8 14

Job J1 J2 J3 J4 J5 Machine M1 7 5 9 8 11 M2 9 12 7 11 10 M3 4 9 8 5 6 M4 7 3 6 9 5 7 M5 4 6 5 11 Max. Marks: 56

Set

SLR-FM-635

e) Find the value of the game

- Q.3 Write notes.
 - a) Decision under uncertainty
 - b) ANN

Section – II

Q.4 Answer any four

- a) Derive the formula for EOQ & explain each term.
- **b)** Explain the importance of ABC analysis with graph.
- c) What is BEP? How it is carried out? How it is used?
- d) Write a note on Quality control chart.
- e) Write note on Profit & loss account and Balance sheet.
- f) Write a note various types inventory cost.
- **g)** ABC corporation has got a demand for particular part at 10000 units per year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine
 - 1) EOQ
 - 2) Optimum number of orders to be placed per annum
 - 3) Total cost of inventory per annum.



SLR-FM-635 Set Q

28

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT – I**

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The cost of keeping items in inventory is called _____ 1)
 - Set up cost b) Holding cost a)
 - c) Shortage cost
 - d) None of these
- 2) Moderate inventory control is sufficient for _
 - A class items a) b) B class items d) All of these
 - C class items C)
- In Dynamic Programming Policy is defined as . 3)
 - a) Point where decision is made
 - Information describing problem at each stage b)
 - C) Decision making rule
 - **Optimal policy** d)
- Hungerian trial and error method is suitable for solving _ 4)
 - Transportation problem b) Assignment problem a) d) Decision tree
 - Two person zero sum game C)
- The solution of decision tree is obtained by _ 5)
 - a) Folding back method b) Games theory
 - c) Laplace criteria d) Dynamic programming
- 6) The biological process of mutation has inspired _
 - Artificial Neural Network a)
- b) Fuzzy logic d) Dynamic programming
- Linear programming deals with the optimization of a function of variable is 7) known as
 - Subjective function a)

Genetic Algorithm

C)

- c) Constraints
- b) Objective function d) All of these
- Allocation of units is not dependent on transport cost in _____ 8)
 - a) VAM method c) Both of these
- b) NW corner method
- d) None of these
- EOQ model helps to find _ 9)
 - Optimum size of order a)
 - Both a) and b) c)

- b) Time interval between order
- d) None of these

Max. Marks: 70

Set

Marks: 14



- 10) Games without a saddle point require player to play _____.
 - a) Mixed strategies
- b) Pure strategies

d) None of these

- c) Dominated strategies
- 11) Acceptance quality level for inspection in stored normally range between

- c) 20 50% d) 50 100%
- 12) Lead time is the time between _____.
 - a) Order and receipt
 - b) Receipt of material and its consumption
 - c) Order and consumption
 - d) Dispatch and receipt
- 13) If 'h' is arrival rate 'w' is waiting time then expected no. of customer 'L' will be _____.
 - a) $L = \lambda w$ b) $L = \lambda / w$
 - c) $L = w / \lambda$ d) $L = w + \lambda$
- 14) In a dustbin opening from top queue discipline is normally _____.
 - a) FIFO

b) LIFO

c) Random

d) None of these

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

ENGINEERING MANAGEMENT - I

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer any three

a) Explain with example Formal and Informal organization.

Ē

b) Find IBFS of the following transportation problem using Least Cost Method.

					Supply
	19	30	50	10	7
	70	30	40	60	9
	40	08	70	20	18
Demand	5	8	7	14	

c) Certain equipment needs 5 repair jobs which have to be assigned to 5 machines. The estimated time in hours that each machine requires to complete the repair job is given in following table.

Job Machine	J1	J2	J3	J4	J5
M1	7	5	9	8	11
M2	9	12	7	11	10
M3	8	5	4	6	9
M4	7	3	6	9	5
M5	4	6	7	5	11

Assuming that each machine can be assigned one job, determine minimum time of assignment.

- d) Write notes on.
 - 1) Monte Carlo Simulation
 - 2) Queuing line theory

Max. Marks: 56

Set

e) Find the value of the game

- Q.3 Write notes.
 - a) Decision under uncertainty
 - b) ANN

Section – II

Q.4 Answer any four

- a) Derive the formula for EOQ & explain each term.
- **b)** Explain the importance of ABC analysis with graph.
- c) What is BEP? How it is carried out? How it is used?
- d) Write a note on Quality control chart.
- e) Write note on Profit & loss account and Balance sheet.
- f) Write a note various types inventory cost.
- **g)** ABC corporation has got a demand for particular part at 10000 units per year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine
 - 1) EOQ
 - 2) Optimum number of orders to be placed per annum
 - 3) Total cost of inventory per annum.



28

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

ENGINEERING MANAGEMENT – I

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data whenever required.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

4)

6)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The biological process of mutation has inspired 1)
 - Artificial Neural Network a)
 - Genetic Algorithm c)
- 2) Linear programming deals with the optimization of a function of variable is known as .
 - a) Subjective function
 - d) All of these Constraints c)
- Allocation of units is not dependent on transport cost in 3)
 - a) VAM method
 - c) Both of these
 - EOQ model helps to find _
 - Optimum size of order a)
 - Both a) and b) c)
- b) Time interval between order

__-

d) Dynamic programming

- Games without a saddle point require player to play 5)
 - Mixed strategies b) Pure strategies a) Dominated strategies d) None of these
 - c) Acceptance quality level for inspection in stored normally range between
 - 0 0.5% b) 0.5 - 3% a)
 - d) 50 100% 20 - 50% c)
- 7) Lead time is the time between _____.
 - Order and receipt a)
 - Receipt of material and its consumption b)
 - Order and consumption c)
 - Dispatch and receipt d)
- 8) If 'h' is arrival rate 'w' is waiting time then expected no. of customer 'L' will be ____.
 - a) $L = \lambda w$ b) $L = \lambda/w$
 - $L = w / \lambda$ d) $L = w + \lambda$ C)

SLR-FM-635

Max. Marks: 70

Marks: 14

- d) None of these
- b) NW corner method

b) Fuzzy logic

d) None of these

b) Objective function

Set S

SLR-FM-635

- 9) In a dustbin opening from top queue discipline is normally _____.
 - a) FIFO

a) A class items

- b) LIFO
- c) Random d) None of these
- 10) The cost of keeping items in inventory is called _____.
 - a) Set up cost b) Holding cost
 - c) Shortage cost d) None of these
- 11) Moderate inventory control is sufficient for _____
 - b) B class items
 - c) C class items d) All of these

12) In Dynamic Programming Policy is defined as _____.

- a) Point where decision is made
- b) Information describing problem at each stage
- c) Decision making rule
- d) Optimal policy
- 13) Hungerian trial and error method is suitable for solving _
 - a) Transportation problem b) Assignment problem
 - c) Two person zero sum game d) Decision tree
- 14) The solution of decision tree is obtained by _____
 - a) Folding back method
- b) Games theory
- c) Laplace criteria
- d) Dynamic programming

.

Seat No.

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT - I

Day & Date: Friday, 13-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figure to the right indicates full marks.

3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer any three

- a) Explain with example Formal and Informal organization.
- b) Find IBFS of the following transportation problem using Least Cost Method.

c) Certain equipment needs 5 repair jobs which have to be assigned to 5 machines. The estimated time in hours that each machine requires to complete the repair job is given in following table.

Job Machine	J1	J2	J3	J4	J5
M1	7	5	9	8	11
M2	9	12	7	11	10
M3	8	5	4	6	9
M4	7	3	6	9	5
M5	4	6	7	5	11

Assuming that each machine can be assigned one job, determine minimum time of assignment.

- d) Write notes on.
 - 1) Monte Carlo Simulation

 $\overline{}$

2) Queuing line theory

Supply 19 30 50 10 7 70 30 40 60 9 40 08 70 20 18 7 Demand 5 8 14

Max. Marks: 56

SLR-FM-635

Set

e) Find the value of the game

- Q.3 Write notes.
 - a) Decision under uncertainty
 - b) ANN

Section – II

Q.4 Answer any four

- a) Derive the formula for EOQ & explain each term.
- **b)** Explain the importance of ABC analysis with graph.
- c) What is BEP? How it is carried out? How it is used?
- d) Write a note on Quality control chart.
- e) Write note on Profit & loss account and Balance sheet.
- f) Write a note various types inventory cost.
- **g)** ABC corporation has got a demand for particular part at 10000 units per year. The cost per unit is Rs 2 and it cost Rs 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 percent of average inventory investment. Determine
 - 1) EOQ
 - 2) Optimum number of orders to be placed per annum
 - 3) Total cost of inventory per annum.



SLR-FM-635 Set S

28
Set

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) In a district where the rainfall is heavy, a state highway of high type bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m 0.05 m b)
 - c) 0.07 m 0.06 m d)

2) The stopping sight distance depends upon _____ b) speed of vehicle

- a) total reaction time c) efficiency of brakes
- d) all of the above When the path travelled along the road surface is more than the circumferential 3)
 - movement of the wheels due to rotation, then it results in . b) Skidding
 - Slipping a) c)
 - Turning d)
- 4) Match List-I with List-II and select the correct answer using the codes given below the lists.

List -1			List -1		
Α	Penetration Test	1	Overlay Design		
В	Marshal Test	2	Determination of Softening Point		
С	Ring and Ball Test	3	Gradation of asphalt cement		
D	Benkelman Beam Test	4	Design of bituminous concrete mix		
a) A-	4, B-3, C-2, D-1		b) A-2, B-3, C-1, D-4		
c) A-	-3, B-2, C-4, D-1	d) A A-3, B-4, C-2, D-1			

Revolving

- On a single lane road with two-way traffic, the minimum stopping sight 5) distance is equal to _ .
 - stopping distance a)
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance

Seat No.

Marks: 14

SLR-FM-636

Max. Marks: 70



Set P

- The maximum allowable Los Angeles abrasion value for high quality surface course is _____.
 - a) 10% b) 20%
 - c) 30% d) 45%
- 7) Maximum number of vehicles can be parked with _____
 - a) parallel parking b) 30° angle parking
 - c) 45° angle parking d) 90° angle parking
- 8) Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 9) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods
- 10) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is _____.
 - a) 15.07cm b) 14.07cm
 - c) 16.07cm d) 17.07cm
- 11) Critical combination of stresses at edge in rigid pavement during summer mid-day are, _____.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 12) The main objective of prime coat is, ____
 - a) Penetrate deep in to the pavement surface and plug the voids
 - b) Coat and bond the loose particles on the surface
 - c) Render the surface of the base course water resistant
 - d) All the above
- 13) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these
- 14) In order to justify the proposed improvement, the benefit-cost ratio should be _____.
 - a) Less than 1.0

- b) Greater than 1.0
- c) Between 0 to 1
- d) Less than 0.5

Seat No.

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

07

14

Set

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic. Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed?
- Write a detailed note on "Origin and Destination studies". C)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? c)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - Initial Traffic in each direction on counting year, N = 184 CV/day. 1)
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- Compare the annual costs of a 2-lane road for two types of pavement a) structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per 1) km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- State methods of tunneling in soft rock. Explain with sketch any one b) method.
- C) Write short notes on:
 - **DBFOT** concept 1)
 - 2) **Tunnel Lining**



Values of L_x/l and L_y/l



Set

SLR-FM-636 Set P

Figure-1







T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – I

Day & Date: Monday,16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 2) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods
- 3) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is _____.
 - a) 15.07cm b) 14.07cm
 - c) 16.07cm d) 17.07cm
- 4) Critical combination of stresses at edge in rigid pavement during summer mid-day are, _____.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 5) The main objective of prime coat is, ____
 - a) Penetrate deep in to the pavement surface and plug the voids
 - b) Coat and bond the loose particles on the surface
 - c) Render the surface of the base course water resistant
 - d) All the above
- 6) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these

Max. Marks: 70

Marks: 14

14

Set

SLR-FM-636

Seat No.

- 7) In order to justify the proposed improvement, the benefit-cost ratio should be ____.
 - a) Less than 1.0
 - b) Greater than 1.0 c) Between 0 to 1 d) Less than 0.5
- 8) In a district where the rainfall is heavy, a state highway of high type bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m b) 0.05 m
 - c) 0.07 m 0.06 m d)

9) The stopping sight distance depends upon ____

- a) total reaction time
- speed of vehicle b)
- c) efficiency of brakes
- When the path travelled along the road surface is more than the circumferential 10) movement of the wheels due to rotation, then it results in _____.
 - a) Slipping b) Skidding
 - Turning d) Revolving c)
- 11) Match List-I with List-II and select the correct answer using the codes given below the lists.

List -1			List -1		
Α	Penetration Test	1	Overlay Design		
В	Marshal Test	2	Determination of Softening Point		
С	Ring and Ball Test	3	Gradation of asphalt cement		
D	Benkelman Beam Test	4	Design of bituminous concrete mix		
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4		
c) A-	·3, B-2, C-4, D-1	d) A A-3, B-4, C-2, D-1			

- On a single lane road with two-way traffic, the minimum stopping sight 12) distance is equal to _____.
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance
- The maximum allowable Los Angeles abrasion value for high quality 13) surface course is
 - a) 10%
 - 20% b) 45% c) 30% d)
- 14) Maximum number of vehicles can be parked with
 - a) parallel parking 30° angle parking b)
 - c) 45° angle parking 90° angle parking d)

- **SLR-FM-636**

- d) all of the above

Max. Marks: 56

14

Seat	
No.	

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic. Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? 07
- Write a detailed note on "Origin and Destination studies". C)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? c)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - 1) Initial Traffic in each direction on counting year, N = 184 CV/day.
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- Compare the annual costs of a 2-lane road for two types of pavement a) structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per 1) km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- State methods of tunneling in soft rock. Explain with sketch any one b) method.
- C) Write short notes on:
 - **DBFOT** concept 1)
 - 2) **Tunnel Lining**



Values of L_x/l and L_y/l

SLR-FM-636 Set Q

Figure-1



IRC: 37-2012



	те	(Dart _ I	
No.			
Seat			

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering TRANSPORTATION ENGINEERING – I

Day & Date: Monday,16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- On a single lane road with two-way traffic, the minimum stopping sight distance is equal to _____.
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance
- 2) The maximum allowable Los Angeles abrasion value for high quality surface course is _____.
 - a) 10% b) 20%
 - c) 30% d) 45%
- 3) Maximum number of vehicles can be parked with _
 - a) parallel parking b) 30° angle parking
 - c) 45° angle parking d) 90° angle parking
- 4) Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 5) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods
- 6) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is _____.
 - a) 15.07cm b) 14.07cm
 - c) 16.07cm d) 17.07cm

)

Max. Marks: 70

Marks: 14

- mid-day are. a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 8) The main objective of prime coat is, ____
 - a) Penetrate deep in to the pavement surface and plug the voids
 - b) Coat and bond the loose particles on the surface
 - c) Render the surface of the base course water resistant
 - d) All the above

7)

- 9) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - b) Starting from the center and ends at center
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these

a) total reaction time

- In order to justify the proposed improvement, the benefit-cost ratio should 10) be
 - a) Less than 1.0 b) Greater than 1.0
 - d) c) Between 0 to 1 Less than 0.5
- In a district where the rainfall is heavy, a state highway of high type 11) bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m b) 0.05 m
 - c) 0.07 m d) 0.06 m
- The stopping sight distance depends upon _____. 12)
 - b) speed of vehicle
 - efficiency of brakes all of the above C) d)
- When the path travelled along the road surface is more than the circumferential 13) movement of the wheels due to rotation, then it results in .
 - a) Slipping Skidding b)
 - c) Turning d) Revolving
- Match List-I with List-II and select the correct answer using the codes 14) given below the lists.

List -1			List -1		
Α	Penetration Test	1	Overlay Design		
В	Marshal Test	2	Determination of Softening Point		
С	Ring and Ball Test	3	Gradation of asphalt cement		
D	Benkelman Beam Test	4	Design of bituminous concrete mix		
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4		

- c) A-3, B-2, C-4, D-1
- d) A A-3, B-4, C-2, D-1

Set

Max. Marks: 56

07

14

Seat No.

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic. Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed?
- Write a detailed note on "Origin and Destination studies". C)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? c)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - 1) Initial Traffic in each direction on counting year, N = 184 CV/day.
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- a) Compare the annual costs of a 2-lane road for two types of pavement structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- **b)** State methods of tunneling in soft rock. Explain with sketch any one method.
- c) Write short notes on:
 - 1) DBFOT concept
 - 2) Tunnel Lining



R

SLR-FM-636

Set

SLR-FM-636 Set R

Figure-1







Seat No.

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) Equivalent radius of resisting section for 20cm thick slab, given that the radius of contact area of wheel load is 15cm is
 - 15.07cm a) b) 14.07cm
 - 16.07cm d) 17.07cm C)
- 2) Critical combination of stresses at edge in rigid pavement during summer mid-day are, _____.
 - a) Load Stress-Warping stress-frictional stress
 - b) Load stress+Warping stress+frictional stress
 - c) Load stress +Warping stress-frictional stress
 - d) Load Stress-Warping stress +frictional stress
- 3) The main objective of prime coat is, _
 - Penetrate deep in to the pavement surface and plug the voids a)
 - Coat and bond the loose particles on the surface b)
 - c) Render the surface of the base course water resistant
 - d) All the above
- 4) In construction of GSB layer, the rolling is done, _____.
 - a) Starting from the center and towards edge
 - Starting from the center and ends at center b)
 - c) Starting from the lower edge and proceeded towards the center
 - d) None of these
- 5) In order to justify the proposed improvement, the benefit-cost ratio should be
 - a) Less than 1.0 Greater than 1.0 b)
 - c) Between 0 to 1 d) Less than 0.5
- 6) In a district where the rainfall is heavy, a state highway of high type bituminous concrete surface pavement 7.0 m wide is to be constructed. What should be the height of the crown with respect to the edges?
 - a) 0.087 m b) 0.05 m
 - c) 0.07 m 0.06 m d)
- 7) The stopping sight distance depends upon _
 - a) total reaction time speed of vehicle b) c) efficiency of brakes
 - d) all of the above

Max. Marks: 70

Marks: 14 14





- 8) When the path travelled along the road surface is more than the circumferential movement of the wheels due to rotation, then it results in _____.
 - a) Slipping

- b) Skidding
- c) Turning d) Revolving
- 9) Match List-I with List-II and select the correct answer using the codes given below the lists.

List -1			List -1		
Α	Penetration Test	1	Overlay Design		
В	Marshal Test	2	Determination of Softening Point		
С	Ring and Ball Test	3	Gradation of asphalt cement		
D	Benkelman Beam Test	4	Design of bituminous concrete mix		
a) A-4, B-3, C-2, D-1			b) A-2, B-3, C-1, D-4		
c) A-3, B-2, C-4, D-1			d) A A-3, B-4, C-2, D-1		

- 10) On a single lane road with two-way traffic, the minimum stopping sight distance is equal to _____.
 - a) stopping distance
 - b) two times the stopping distance
 - c) half the stopping distance
 - d) three times the stopping distance
- 11) The maximum allowable Los Angeles abrasion value for high quality surface course is _____.
 - a) 10% b) 20%
 - c) 30% d) 45%
- 12) Maximum number of vehicles can be parked with ____
 - a) parallel parking b) 30° angle parking
 - c) 45° angle parking d) 90° angle parking
- 13) Essential requirement of soil properties which is used for subgrade construction are _____.
 - a) LL to be less than 50% and PI to be less than 25
 - b) LL to be less than 60% and PI to be less than 25
 - c) LL to be less than 65% and PI to be less than 30
 - d) LL to be less than 700% and PI to be less than 35
- 14) Which one of the following methods is generally considered the best for tunnel ventilation?
 - a) Driving a drift through the tunnel
 - b) 'Blow in' method
 - c) 'Blowout' method
 - d) Combination of 'Blow in' and 'Blowout' methods

14

Seat	
No.	

T. E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering TRANSPORTATION ENGINEERING – I**

Day & Date: Monday, 16-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Section – I

Solve any TWO (7 marks each) Q.2

- Calculate the safe overtaking sight distance from the following data for one 07 a) way and two-way traffic. Speed of overtaking vehicle = 96 kmph. 1)
 - Speed of overtaken vehicle = 22 kmph. 2)
 - 3) Reaction time of driver = 2 sec.
 - 4) Rate of acceleration = 2.5 kmph/sec
- A radius of 250 m has to be provided at a locality due to site restrictions on 07 b) a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? 07
- Write a detailed note on "Origin and Destination studies". C)

Q.3 Solve any TWO (7 marks each)

- Discuss different factors that affect highway alignment with neat sketch. 07 a)
- Define camber. State its different types and values adopted under different b) 07 road conditions. 07
- What is highway drainage? How it is carried out? c)

Section – II

Answer any two questions (7 marks each) Q.4

- Enumerate the construction steps of Bituminous Concrete pavement. a)
- Determine the warping stresses at interior, edge and corner of a 25cm b) thick cement concrete pavement with transverse joints at 5.0m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction K is 6.9kg/cm³ and radius of loaded area is 15cm. Assume temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and maximum temperature differential of 0.4°C per cm slab thickness during the night (for warping stress at the corner). Assume $e=10x10^{-6}$ per °C, $E=3x10^{-5}$ kg/cm², $\mu=0.15$. Use Bradbury chart given in Figure-I.
- Design the flexible pavement using IRC guidelines for the following data. c) Input data:
 - 1) Initial Traffic in each direction on counting year, N = 184 CV/day.
 - Construction period since last traffic count, x = 2 Years 2)
 - 3) Design Life of pavement to be considered, n = 15 Years.
 - Design CBR of Subgrade soil to be employed, = 5%. 4)
 - Traffic Growth Rate, r = 7.5 %. 5)
 - Vehicle Damage Factor as per axle load survey, F = 3.5. 6)
 - Lane Distribution factor, D = 0.757)
 - Directional Distribution = 1.00 8)

Use Plate-3 to 5 of IRC-37-2012.

Q.5 Answer any two questions (7 marks each)

- a) Compare the annual costs of a 2-lane road for two types of pavement structures:
 - WBM with thin bituminous surface at total cost of Rs. 108 lakhs per km, life of 5 years, interest at 10%, salvage value of Rs. 10 lakhs after 5 years, annual average maintenance cost of Rs. 0.35 lakhs per km and
 - 2) Bituminous Macadam Base and bituminous concrete surface, total cost of Rs. 197 Lakhs, life of 15 years, interest at 8%, salvage value of 25 lakhs at the end of 15 years, annual average maintenance cost of Rs. 0.75 lakhs per km.
- **b)** State methods of tunneling in soft rock. Explain with sketch any one method.
- c) Write short notes on:
 - 1) DBFOT concept
 - 2) Tunnel Lining



S

SLR-FM-636

Set

SLR-FM-636 Set S

Figure-1







Seat	
No.	

Duration: 30 Minutes

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Suitable assumptions if necessary and state them clearly

MCQ/Objective Type Questions

Q.1 State whether following statement is correct or incorrect.

- 1) ICU in hospital means Intensive Care Unit.
- 2) Minimum width of a door opening in a school is 1.0m.
- 3) The horizontal angle of vision should not be greater than 20° .
- 4) The slope for floor of Auditorium/Cinema theatre may be with an inclination of 8° to 15° from frontside.
- 5) The desirable sound intensity inside a hotel room is less than 45 dB.
- 6) The plan of a cinema theatre should be such that the walls converge towards the screen.
- 7) The desirable maximum distance between last row and the screen when no sound reflectors are provided is 23m.
- 8) In one point perspective only two sides of object is of true dimension in perspective view.
- 9) The vertical angle of vision should not be greater than 20° .
- 10) Echo is dullsound.
- 11) The minimum clearance between the bed and the side wall is 300mm.
- 12) Reverberation is desirable to add to the musical quality.
- 13) Passage/corridor width in Primary Health Centre range from 0.5m to1.0m.
- 14) Height of counter in post office should range from 1.6m to 1.8m



Max. Marks: 70

Marks: 14

Seat <u>No.</u> T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) All questions are compulsory.

- 2) Retain all projection/construction lines on drawing sheet.
 - 3) Assume suitable data wherever necessary and mention it clearly.
 - 4) Figure to right indicate full marks.
 - 5) Use answer book for section II
 - 6) Use both sides of full imperial drawing sheet for section I

Section – I

- Q.2 a) It is proposed to construct at wostoreyed shopping complex with the following data
 - 1) Entrance: 20 to 30sq.m.
 - 2) Bigshops: 6nos.30 to 40sq.m.each
 - 3) Smallshops: 8nos.20sq.m.each
 - 4) Facility center: 4nos
 - 5) Separate sanitary blocks for ladies and gents
 - 6) Staircase for future expansion
 - 7) Passages 2 to 2.5 wide.
 - b) The building is R.C.C framed structure. Assume additional data if required 12 and mention it clearly.

Draw

- 1) A detailed plan (scale 1:100)
- 2) A sectional elevation passing through sanitary block sand stair case (Scale1:100).

Section – II

Q.3 Attempt any four of the following

- a) Explain in brief "Green Building".
- b) Write a note on any two methods of sound insulation for RCC public building with neat sketch.
- c) Explain the importance of AUTOCAD and describe any four commands of CAD.
- d) Explain the Sabine's formula and reverberation.
- e) What should be the consideration in planning of building for fire protection?
- f) Explain in brief "types of fireload".

Max. Marks: 56

SLR-FM-637

Set

Ρ

16

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Suitable assumptions if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 State whether following statement is correct or incorrect.

- 1) In one point perspective only two sides of object is of true dimension in perspective view.
- 2) The vertical angle of vision should not be greater than 20° .
- 3) Echo is dullsound.
- 4) The minimum clearance between the bed and the side wall is 300mm.
- 5) Reverberation is desirable to add to the musical quality.
- 6) Passage/corridor width in Primary Health Centre range from 0.5m to1.0m.
- 7) Height of counter in post office should range from 1.6m to 1.8m
- 8) ICU in hospital means Intensive Care Unit.
- 9) Minimum width of a door opening in a school is 1.0m.
- 10) The horizontal angle of vision should not be greater than 20° .
- 11) The slope for floor of Auditorium/Cinema theatre may be with an inclination of 8^0 to 15^0 from frontside.
- 12) The desirable sound intensity inside a hotel room is less than 45 dB.
- 13) The plan of a cinema theatre should be such that the walls converge towards the screen.
- 14) The desirable maximum distance between last row and the screen when no sound reflectors are provided is 23m.



Set

Max. Marks: 70

Marks: 14

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019

Time: 02:30 PM To 06:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Retain all projection/construction lines on drawing sheet.
 - 3) Assume suitable data wherever necessary and mention it clearly.
 - 4) Figure to right indicate full marks.
 - 5) Use answer book for section II
 - 6) Use both sides of full imperial drawing sheet for section I

Section – I

- **Q.2 a)** It is proposed to construct at wostoreyed shopping complex with the following data
 - 1) Entrance: 20 to 30sq.m.
 - 2) Bigshops: 6nos.30 to 40sq.m.each
 - 3) Smallshops: 8nos.20sq.m.each
 - 4) Facility center: 4nos
 - 5) Separate sanitary blocks for ladies and gents
 - 6) Staircase for future expansion
 - 7) Passages 2 to 2.5 wide.
 - b) The building is R.C.C framed structure. Assume additional data if required 12 and mention it clearly.

Draw

- 1) A detailed plan (scale 1:100)
- 2) A sectional elevation passing through sanitary block sand stair case (Scale1:100).

Section – II

Q.3 Attempt any four of the following

- a) Explain in brief "Green Building".
- b) Write a note on any two methods of sound insulation for RCC public building with neat sketch.
- c) Explain the importance of AUTOCAD and describe any four commands of CAD.
- d) Explain the Sabine's formula and reverberation.
- e) What should be the consideration in planning of building for fire protection?
- f) Explain in brief "types of fireload".

Max. Marks: 56

SLR-FM-637

Set

Q

16

Seat			
No.			

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Suitable assumptions if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 State whether following statement is correct or incorrect.

- 1) The desirable sound intensity inside a hotel room is less than 45 dB.
- 2) The plan of a cinema theatre should be such that the walls converge towards the screen.
- 3) The desirable maximum distance between last row and the screen when no sound reflectors are provided is 23m.
- 4) In one point perspective only two sides of object is of true dimension in perspective view.
- 5) The vertical angle of vision should not be greater than 20° .
- 6) Echo is dullsound.
- 7) The minimum clearance between the bed and the side wall is 300mm.
- 8) Reverberation is desirable to add to the musical quality.
- 9) Passage/corridor width in Primary Health Centre range from 0.5m to1.0m.
- 10) Height of counter in post office should range from 1.6m to 1.8m
- 11) ICU in hospital means Intensive Care Unit.
- 12) Minimum width of a door opening in a school is 1.0m.
- 13) The horizontal angle of vision should not be greater than 20° .
- 14) The slope for floor of Auditorium/Cinema theatre may be with an inclination of 8^0 to 15^0 from frontside.



Max. Marks: 70

Marks: 14

Seat No. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019

Time: 02:30 PM To 06:30 PM

Instructions: 1) All questions are compulsory.

- 2) Retain all projection/construction lines on drawing sheet.
 - 3) Assume suitable data wherever necessary and mention it clearly.
 - 4) Figure to right indicate full marks.
 - 5) Use answer book for section II
 - 6) Use both sides of full imperial drawing sheet for section I

Section – I

- Q.2 a) It is proposed to construct at wostoreyed shopping complex with the following data
 - 1) Entrance: 20 to 30sq.m.
 - 2) Bigshops: 6nos.30 to 40sq.m.each
 - 3) Smallshops: 8nos.20sq.m.each
 - 4) Facility center: 4nos
 - 5) Separate sanitary blocks for ladies and gents
 - 6) Staircase for future expansion
 - 7) Passages 2 to 2.5 wide.
 - b) The building is R.C.C framed structure. Assume additional data if required 12 and mention it clearly.

Draw

- 1) A detailed plan (scale 1:100)
- 2) A sectional elevation passing through sanitary block sand stair case (Scale1:100).

Section – II

Q.3 Attempt any four of the following

- a) Explain in brief "Green Building".
- b) Write a note on any two methods of sound insulation for RCC public building with neat sketch.
- c) Explain the importance of AUTOCAD and describe any four commands of CAD.
- d) Explain the Sabine's formula and reverberation.
- e) What should be the consideration in planning of building for fire protection?
- f) Explain in brief "types of fireload".

Max. Marks: 56

28

SLR-FM-637

Set

R

Seat No.

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Suitable assumptions if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes

IVIG

Q.1 State whether following statement is correct or incorrect.

- 1) Echo is dullsound.
- 2) The minimum clearance between the bed and the side wall is 300mm.
- 3) Reverberation is desirable to add to the musical quality.
- 4) Passage/corridor width in Primary Health Centre range from 0.5m to1.0m.
- 5) Height of counter in post office should range from 1.6m to 1.8m
- 6) ICU in hospital means Intensive Care Unit.
- 7) Minimum width of a door opening in a school is 1.0m.
- 8) The horizontal angle of vision should not be greater than 20° .
- 9) The slope for floor of Auditorium/Cinema theatre may be with an inclination of 8^0 to 15^0 from frontside.
- 10) The desirable sound intensity inside a hotel room is less than 45 dB.
- 11) The plan of a cinema theatre should be such that the walls converge towards the screen.
- 12) The desirable maximum distance between last row and the screen when no sound reflectors are provided is 23m.
- 13) In one point perspective only two sides of object is of true dimension in perspective view.
- 14) The vertical angle of vision should not be greater than 20° .



Max. Marks: 70

Marks: 14

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering BUILDING PLANNING & DESIGN

Day & Date: Wednesday, 18-12-2019

Time: 02:30 PM To 06:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Retain all projection/construction lines on drawing sheet.
 - 3) Assume suitable data wherever necessary and mention it clearly.
 - 4) Figure to right indicate full marks.
 - 5) Use answer book for section II
 - 6) Use both sides of full imperial drawing sheet for section I

Section – I

- **Q.2 a)** It is proposed to construct at wostoreyed shopping complex with the following data
 - 1) Entrance: 20 to 30sq.m.
 - 2) Bigshops: 6nos.30 to 40sq.m.each
 - 3) Smallshops: 8nos.20sq.m.each
 - 4) Facility center: 4nos
 - 5) Separate sanitary blocks for ladies and gents
 - 6) Staircase for future expansion
 - 7) Passages 2 to 2.5 wide.
 - b) The building is R.C.C framed structure. Assume additional data if required 12 and mention it clearly.

Draw

- 1) A detailed plan (scale 1:100)
- 2) A sectional elevation passing through sanitary block sand stair case (Scale1:100).

Section – II

Q.3 Attempt any four of the following

- a) Explain in brief "Green Building".
- b) Write a note on any two methods of sound insulation for RCC public building with neat sketch.
- c) Explain the importance of AUTOCAD and describe any four commands of CAD.
- d) Explain the Sabine's formula and reverberation.
- e) What should be the consideration in planning of building for fire protection?
- f) Explain in brief "types of fireload".

Max. Marks: 56

SLR-FM-637

Set

S

16

Seat No.	:				Set	Ρ
		T.E. (Part – I) (Old) (CGF Self Learn INTRODUCTIO	PA) Exami hing (All B ON OF SC	nation Nov/Dec-2019 sranch) OCIOLOGY		
Day & Time:	& Date : 02:3	e: Thursday, 19-12-2019 0 PM To 04:30 PM		Max	. Marks	: 50
Instru	uctio	ns: 1) Q.No.1 is compulsory an book 2) Figures to the right indica	d should be ate full mark	solved in first 20 minutes i s.	n answe	er
Durat	ion: 2	20 Minutes			Marks	5: 10
Q.1	Cho	ose the correct alternatives fr	om the opt	ions.		10
	1)	The term sociology was givena) Herbert Spencerc) Karl Marx	by b) d)	August Comte Max Weber		
	2)	Status and are interrel a) Position c) Role	ated and int b) d)	erdepended. Function Person		
	3)	Urban society is a) Heterogeneous c) Cultural	b) d)	Homogeneous Normative		
	4)	A family is unit. a) Social c) Cultural	b) d)	Bilateral Unilateral		
	5)	Castes are groups. a) Religious c) Exogamous	b) d)	Formal Endogamous		
	6)	The term Sanskritization was g a) Ghurye c) Sriniwas	given by b) d)	Mukherjee Dr. Ambedkar		
	7)	The directions of social changea) Uncertainc) Positive	e are b) d)	 Certain Negative		
	8)	A Social movement runs with _a) Mediac) Government	 b) d)	ldeology Philosophy		
	9)	The process of socialization in a) Anal c) Oedipal	itiates at b) d)	stage. Oral Adult		
	10)	Environmental science is the s a) Nature c) Diversity	tudy of b) d)	 Society Srroundings		

		SL	.R-FM-6	38
Seat No.	t		Set	Ρ
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-20 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY)19	
Day a Time	& Da : 02:	ite: Thursday, 19-12-2019 30 PM To 04:30 PM	Max. Marks	s: 40
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.		
Q.2	Wri a) b) c) d) e) f)	te answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?		16
Q.3	a)	Explain the environmental changes and related development in In OR	dia.	12
_	b)	What are the agencies of socialization?		
Q.4	Wh	at the conventional characteristics of caste in India?		12

Seat	t							Set	Q
INO.		т г					notion Nov/Dec 2011	n	
		1.0	. (Part –	Self Lear	ning (/	All B	ranch)	9	
			I	ITRODUCT		F SC	OCIOLÓGY		
Day & Time	& Date : 02:3	e: Th 0 PN	ursday, 19- 1 To 04:30 F	12-2019 PM			Ma	ax. Marks	: 50
Instr	uctio	ns: 1 2) Q.No.1 is book	compulsory a	nd shou	ld be mark	solved in first 20 minutes	s in answ	er
Durat	tion: 2	2 0 Mi	nutes			man	5.	Marks	. 10
Q.1	Cho	ose t	he correct	alternatives	from the	e opt	ions.	marite	10
	1)	The	term Sansk	critization was	given b	y			
		a) c)	Ghurye Sriniwas			b) d)	Mukherjee Dr. Ambedkar		
	2)	The a) c)	directions o Uncertain Positive	of social chang	ge are _	b) d)	 Certain Negative		
	3)	A So a) c)	ocial moven Media Governme	nent runs with nt		b) d)	ldeology Philosophy		
	4) The process of socialization initiates at stage			stage.					
	·	a) c)	Anal Oedipal			b) d)	Oral Adult		
	5)	Envi a) c)	ironmental s Nature Diversity	science is the	study of	b) d)	 Society Srroundings		
	6)	The a) c)	term sociol Herbert Sp Karl Marx	ogy was giver encer	ו by	b) d)	August Comte Max Weber		
	7)	Stat a) c)	us and Position Role	are interro	elated ar	nd int b) d)	erdepended. Function Person		
	8)	Urba a) c)	an society is Heterogen Cultural	s eous		b) d)	Homogeneous Normative		
	9)	A fa a) c)	mily is Social Cultural	unit.		b) d)	Bilateral Unilateral		
	10)	Cas a) c)	tes are Religious Exogamou	groups. s		b) d)	Formal Endogamous		

	SLR-FM-638					
Seat No.	t	Se	t	Q		
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY	_			
Day a Time	& Da : 02:	ate: Thursday, 19-12-2019 Max. Ma 30 PM To 04:30 PM	rks	: 40		
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.				
Q.2	Wri a) b) c) d) e) f)	ite answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?		16		
Q.3	a)	Explain the environmental changes and related development in India. OR		12		
	b)	What are the agencies of socialization?				
Q.4	Wh	at the conventional characteristics of caste in India?		12		

Sea No.	t							Set	R
		T.E	E. (Part – I	l) (Old) (C Self Lea NTRODUC	GPA) Ex arning (/ TION OI	ami All B F SC	nation Nov/Dec-201 Franch) OCIOLOGY	9	
Day Time	& Date : 02:3	e: Th 0 PN	ursday, 19- /I To 04:30 F	12-2019 PM			Μ	ax. Marks	: 50
Instr	uctio	ns: 1	l) Q.No.1 is book 2) Figures to	compulsory	and shou dicate full	ld be mark	solved in first 20 minute	s in answ	er
Dura	tion: 2	- 0 Mi	inutes			- not in		Marks	: 10
01	Cho	nsei	the correct	alternative	s from the	e onf	ions	maria	10
Q . 1	1)	The	process of	socialization	initiates a	at	stage.		
	• /	a)	Anal	e e e la		b)	Oral		
		c)	Oedipal			d)	Adult		
	2)	Env	ironmental s	science is th	e studv of	:			
	_,	a)	Nature		,	b)	Society		
		c)	Diversity			d)	Srroundings		
	3)	The	term sociol	ogy was giv	en by				
	,	a)	Herbert Sp	encer	,	b)	August Comte		
		c)	Karl Marx			d)	Max Weber		
	4)	Stat	tus and	are inte	rrelated ar	nd int	erdepended.		
	,	a)	Position			b)	Function		
		c)	Role			d)	Person		
	5)	Urb	an society is	S					
		a)	Heterogen	eous		b)	Homogeneous		
		c)	Cultural			d)	Normative		
	6)	A fa	mily is	unit.					
		a)	Social			b)	Bilateral		
		c)	Cultural			d)	Unilateral		
	7)	Cas	tes are	groups.					
		a)	Religious			b)	Formal		
		C)	Exogamou	S		d)	Endogamous		
	8)	The	term Sansk	critization wa	is given b	у	·		
		a)	Ghurye			b)	Mukherjee		
		C)	Sriniwas			d)	Dr. Ambedkar		
	9)	The	directions of	of social cha	nge are _				
		a)	Uncertain			b)	Certain		
		C)	Positive			a)	negative		
	10)	AS	ocial moven	nent runs wi	th	 	l de el e en c		
		a)	Iviedia	nt		מ) לא	laeology Philosophy		
		U)	Governine	110		u)	гниозорну		

Г

	SLR-FM-638					
Seat No.	t	Set	R			
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY				
Day a Time	& Da : 02:	te: Thursday, 19-12-2019 Max. Mar 30 PM To 04:30 PM	<s: 40<="" td=""></s:>			
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.				
Q.2	Wri a) b) c) d) e) f)	te answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?	16			
Q.3	a)	Explain the environmental changes and related development in India. OR	12			
	b)	What are the agencies of socialization?				
Q.4	Wh	at the conventional characteristics of caste in India?	12			

INO.								
		T.E	E. (Part – I) IN) (Old) (CGI Self Learı TRODUCTI	PA) Exa ning (Al ON OF 3	mi I B SC	nation Nov/Dec-2 ranch) CIOLOGY	019
Day Time	& Date : 02:3	e: Th 0 PN	ursday, 19-1 / To 04:30 P	12-2019 M				Max. Marks: 50
Instr	uctio	ns: 1) Q.No.1 is o book 2) Figures to	compulsory ar the right indic	nd should ate full ma	be ark	solved in first 20 minu s.	ites in answer
Dura	tion: 2	20 Mi	inutes	5				Marks: 10
Q 1	Cho	ose	the correct :	alternatives f	rom the c	ont	ions	10
	1)	Urba a) c)	an society is Heterogene Cultural	 20US	b d))	Homogeneous Normative	
	2)	A fa a) c)	mily is Social Cultural	unit.	b d)	Bilateral Unilateral	
	3)	Cas a) c)	tes are Religious Exogamous	groups.	b d))	Formal Endogamous	
	4)	The a) c)	term Sansk Ghurye Sriniwas	ritization was	_ given by b d)	 Mukherjee Dr. Ambedkar	
	5)	The a) c)	directions o Uncertain Positive	f social chang	e are b d)	 Certain Negative	
	6)	A S a) c)	ocial movem Media Governmer	ent runs with j	 b d)	ldeology Philosophy	
	7)	The a) c)	process of s Anal Oedipal	socialization ir	iitiates at b d)	stage. Oral Adult	
	8)	Env a) c)	ironmental s Nature Diversity	cience is the s	study of _ b d)	 Society Srroundings	
	9)	The a) c)	term sociolo Herbert Spe Karl Marx	ogy was given encer	byb d))	August Comte Max Weber	
	10)	Stat a) c)	us and Position Role	are interre	lated and b d	int))	erdepended. Function Person	

Set S

-								
Seat	t		Sot	S				
No.			Jei	J				
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) INTRODUCTION OF SOCIOLOGY						
Day & Time	& Da : 02:	ate: Thursday, 19-12-2019 Max 30 PM To 04:30 PM	. Marks	:: 40				
Instr	uctio	ons: 1) All questions are compulsory.2) Figure to the right indicates full marks.						
Q.2	Wri a) b) c) d) e) f)	ite answer on any Four of the following: Explain the meaning and elements of social structure. Discuss on demographic features of India. Elucidate nature and types of social institutions. Explain the nature and process of social change. Give and account of nature and types of social movements. What is Human Ecology?		16				
Q.3	a)	Explain the environmental changes and related development in India. OR		12				
	b)	What are the agencies of socialization?						
Q.4	Wh	at the conventional characteristics of caste in India?		12				
T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES Day & Date: Thursday, 19-12-2019 Max. Marks: 50 Time: 02:30 PM To 04:30 PM Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures to the right indicate full marks. MCQ/Objective Type Questions Duration: 20 Minutes Marks: 10 QL Choose the correct alternatives from the options. 10 Outration: 20 Minutes Marks: 10 QL Choose the correct alternatives from the options. 10 Outration: 20 Minutes Marks: 10 QL Choose the correct alternatives from the options. 10 Only Values	Seat No.						Set	Ρ
--	----------------	----------------	---	--------------------------	-------------	-------------------------------	--------	-------
Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES Day & Date: Thursday, 19-12-2019 Max. Marks: 50 Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures to the right indicate full marks. 2) Figures to the right indicate full marks. MCQ/Objective Type Questions Duration: 20 Minutes Marks: 10 Q.1 Choose the correct alternatives from the options. 10 1) Morals are the welfare principles enunciated by the a) Wise People b) Based on their experience c) Group of People d) None of Above 11 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values b) Society a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are			T.E. (Part – I)	(Old) (CGPA) E	xar	nination Nov/Dec-2019		
Day & Date: Thursday, 19-12-2019 Max. Marks: 50 Time: 02:30 PM To 04:30 PM Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures to the right indicate full marks. MCQ/Objective Type Questions Duration: 20 Minutes Marks: 10 Questions Duration: 20 Minutes Marks: 10 Questions Duration: 20 Minutes Marks: 10 Questions Marks: 10 Questions Duration: 20 Minutes Marks: 10 Questions			PROFES	Self Learning	(All S &	Branch) HUMAN VALUES		
Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures to the right indicate full marks. MCQ/Objective Type Questions Duration: 20 Minutes Marks: 10 Q.1 Choose the correct alternatives from the options. 1) Morals are the welfare principles enunciated by the a) Wise People b) Based on their experience c) Group of People d) None of Above 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) eff-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage d) Adherence to ethical principles c) EMPATHY d) Adherence to ethical principles c) EMPATHY d) Adherence to ethical principles c) EMPATHY d) Adherence to ethical principles	Day & Time:	C Date 02:3	e: Thursday, 19-1 0 PM To 04:30 P	2-2019 M		Max.	Marks	s: 50
 2) Figures to the right indicate full marks. MCQ/Objective Type Questions Duration: 20 Minutes Marks: 10 Q.1 Choose the correct alternatives from the options. 10 1) Morals are the welfare principles enunciated by the a) Wise People b) Based on their experience c) Group of People d) None of Above 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral dy ords b) Honesty c) Moral and words b) Sector attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Wirtue b) Truthfulness c) T trustworthiness d) Acherence to ethical principles d) Social courage d) Acherence to ethical principles e) EMPATHY d) Adherence to ethical principles e) EMPATHY 	Instru	uction	ns: 1) Q.No.1 is book.	compulsory and sh	ould	be solved in first 20 minutes	in ans	swer
MCQ/Objective Type Questions Duration: 20 Minutes Marks: 10 Q.1 Choose the correct alternatives from the options. 10 1) Morals are the welfare principles enunciated by the 10 1) Morals are the welfare principles enunciated by the 10 1) Morals are the welfare principles enunciated by the 10 1) Morals are the welfare principles enunciated by the 10 1) Morals are the welfare principles enunciated by the 10 2) Ethics is the word that refers to 10 2) Ethics is the word that refers to 10 3) The study on ethics helps to know the people's 10 2) Morality 0 Psychology 3) The study on ethics helps to know the people's 10 4) What is Integrity? 10 10 a) Learn good or bad things b) Copyright 10 c) Moral d) 15 years 5) 5) Work ethics is defined as a 10 15 years 6) <td< td=""><td></td><td></td><td>2) Figures to</td><td>the right indicate fu</td><td>ll ma</td><td>rks.</td><td></td><td></td></td<>			2) Figures to	the right indicate fu	ll ma	rks.		
Duration: 20 Minutes Marks: 10 Q.1 Choose the correct alternatives from the options. 10 1) Morals are the welfare principles enunciated by the a) Wise People b) Based on their experience c) a) Wise People b) Based on their experience c) Group of People d) None of Above 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Moral b) Truthfulness c) Virtues are a) Moral b) Ethics c) Values d) Comm				MCQ/Objective T	уре	Questions		
Q.1 Choose the correct alternatives from the options. 10 1) Morals are the welfare principles enunciated by the a) Wise People b) Based on their experience a) Wise People b) None of Above 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Moral words b) Honesty d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) Positive and preferred values 8) Honesty is a a) Woral c) Virtues are a) O Communication <t< td=""><td>Durati</td><td>ion: 2</td><td>0 Minutes</td><td></td><td></td><td></td><td>Marks</td><td>s: 10</td></t<>	Durati	ion: 2	0 Minutes				Marks	s: 10
1) Morals are the welfare principles enunciated by the a) Wise People b) Based on their experience c) Group of People d) None of Above 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morallity d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values b) Society c) c) Home d) None of the above 7) Virtues are a) Motals b) Ethics c) Homesty is a a) Moral b)	Q.1	Choo	ose the correct a	alternatives from tl	he o	ptions.		10
 a) Wise People b) Based on their experience c) Group of People d) None of Above 2) Ethics is the word that refers to		1)	Morals are the w	velfare principles en	iunci	ated by the		
 a) Ethics is the word that refers to a) Human tendencyb) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage f) Commitment means a) Alignment to goals b) Adherence to ethical principles 			a) Wise Peopl	e Ponle	d)	Based on their experience		
 2) Ethics is the word that refers to a) Human tendency b) Morals, values, and beliefs c) Only Values d) Psychology 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles 		2)	C) Group of re	rd that refere to	u)			
 c) Only Values d) Psychology 3) The study on ethics helps to know the people's		2)	a) Human ten	dency	 b)	Morals, values, and beliefs		
 3) The study on ethics helps to know the people's a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) Adherence to ethical principles 			c) Only Values	S	d)	Psychology		
 a) Learn good or bad things b) Copyright c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 		3)	The study on eth	nics helps to know t	he p	eople's		
 c) Morality d) Beliefs, values, and morals 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social problems exist in the means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 		,	a) Learn good	or bad things	b)	Copyright		
 4) What is Integrity? a) Thought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 			c) Morality		d)	Beliefs, values, and morals		
 a) Inought and words b) Honesty c) Moral d) 15 years 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage f) Commitment means a) Alignment to goals b) Adherence to ethical principles 		4)	What is Integrity	? 	L.)	l levent.		
 5) Work ethics is defined as a a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			a) I nought anc) Moral	a words	(a (b	Honesty 15 years		
 a) Motivation b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) All the above 		5)	Work ethics is d	efined as a	u)	To yours		
 b) Set of attitudes concerned with the value of work c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 		3)	a) Motivation					
 c) Attitude d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY c) All the above 			b) Set of attitu	des concerned with	the	value of work		
 d) Values 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			c) Attitude					
 6) Many complex social problems exist in the a) Industry/ Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 		•	d) values					
 a) Industry Business b) Society c) Home d) None of the above 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY c) All the above 		6)	Many complex s	social problems exis	t in t	he Society		
 7) Virtues are a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence a) elf-confidence a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage a) Alignment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 			c) Home	15111655	d)	None of the above		
 a) Moral b) Ethics c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Courage is the tendency to accept and face a) elf-confidence a) elf-confidence a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage a) Alignment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 		7)	Virtues are)			
 c) Values d) positive and preferred values 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 		.,	a) Moral	·	b)	Ethics		
 8) Honesty is a a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			c) Values		d)	positive and preferred value	S	
 a) Virtue b) Truthfulness c) T trustworthiness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 		8)	Honesty is a	·				
 c) I trustwortniness d) Communication 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			a) Virtue	· · · · · ·	b)	Truthfulness		
 9) Courage is the tendency to accept and face a) elf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY 		•	c) I trustworth	nness	a)	Communication		
 a) enf-confidence b) Risks and difficult tasks in rational ways c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 		9)	Courage is the t	endency to accept a	and t	ace		
 c) Physical courage d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			b) Risks and d	lifficult tasks in ratio	nalv	vavs		
 d) Social courage 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			c) Physical co	urage		,		
 10) Commitment means a) Alignment to goals b) Adherence to ethical principles c) EMPATHY d) All the above 			d) Social cours	age				
a) Alignment to goals b) Adherence to ethical principles		10)	Commitment me	eans				
			a) Alignment to	o goais	(a (b	Adherence to ethical princip	ies	

Page **1** of **8**

SLR-FM-639

SLR-FM-6	539
Set	Ρ
T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES	
& Date: Thursday, 19-12-2019 Max. Marks : 02:30 PM To 04:30 PM	s: 40
uctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks.	
What are the Objectives of Engineering Ethics?	10
What is the Difference Between Moral and Ethics? OR	10
What is Value and Types of Values.	10
 Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics 	20
	SLR-FM-6 Set T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES & Date: Thursday, 19-12-2019 Max. Marks C02:30 PM To 04:30 PM uctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks. What are the Objectives of Engineering Ethics? What is the Difference Between Moral and Ethics? What is the Difference Between Moral and Ethics? What is Value and Types of Values. Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics

f) Virtues

		T.E	E. (Part – I) (Old) (CGP/ SELF LEARNII	A) Exan NG (AL	nination Nov/Dec-2019 L BRANCH)	
			PROFESSIONAL ET	HICS &	HUMAN VÁLUES	
Day Time	& Dat e: 02:3	e: Th 30 PN	nursday, 19-12-2019 / To 04:30 PM		Max. Marks:	50
Inst	ructio	T.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 SELF LEARNING (ALL BRANCH) PROFESSIONAL ETHICS & HUMAN VALUES e: Thursday, 19-12-2019 Max. Marks: 50 10 PM To 04:30 PM Max. Marks: 50 10 PM To 04:30 PM Max. Marks: 50 10 PM To 04:30 PM Max. Marks: 50 10 Q.No.1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures to the right indicate full marks. 20 Minutes Marks: 10 0 see the correct alternatives from the options. 10 30 Industry/ Business b) Society 10 A) Industry/ Business b) Society 10 C) Home d) None of the above 10 Virtues are				
		2) Figures to the right indicat	e full ma	rks.	
			MCQ/Objectiv	ие Туре	Questions	
Dura	ation: 2	20 Mi	inutes		Marks:	10
Q.1	Cho	ose t	the correct alternatives fro	m the o	otions.	10
	1)	Mai	ny complex social problems	exist in t	he	
		a)	Industry/ Business	b)	Society	
		C)	Home	d)	None of the above	
	2)	Virt	ues are			
		a)	Moral	b)	Ethics	
		C)	values	u)	positive and preferred values	
	3)	Hor	nesty is a	L)	Truthfullesse	
		a)	VIITUE T trustworthingss	(a (b	Communication	
	4)	0) Ooi		u) Antanal f		
	4)	a) b) c) d)	elf-confidence Risks and difficult tasks in Physical courage Social courage	rational v	ace vays	
	5)	Cor	nmitment means			
	·	a) c)	Alignment to goals EMPATHY	b) d)	Adherence to ethical principles All the above	
	6)	Мо	rals are the welfare principle	s enunci	ated by the	
		a)	Wise People	b)	Based on their experience	
		c)	Group of People	d)	None of Above	
	7)	Eth	ics is the word that refers to	<u> </u>		
		a)	Human tendency	b)	Morals, values, and beliefs	
		C)	Only Values	d)	Psychology	
	8)	The	e study on ethics helps to kn	ow the p	eople's	
		a)	Learn good or bad things	b)	Copyright	
		C)	Morality	a)	Beliefs, values, and morals	
	9)	Wh	at is Integrity?			
		a)	I hought and words	b)	Honesty	
		0)		u)	is years	
	10)	Wo a) b)	rk ethics is defined as a Motivation Set of attitudes concerned	 with the	value of work	
		U)				

Seat No.

d) Values

SLR-FM-639

Set Q

	SLF	₹-FM-€	539
Sea No.	t	Set	Q
	T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-201 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES	9	
Day of Time	& Date: Thursday, 19-12-2019 N e: 02:30 PM To 04:30 PM	lax. Marks	s: 40
Instr	Tuctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks.		
Q.2	What are the Objectives of Engineering Ethics?		10
Q.3	What is the Difference Between Moral and Ethics? OR		10
	What is Value and Types of Values.		10
Q.4	 Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics 		20

f) Virtues

			7			
Seat No.					Set F	2
		T.E. (Part – S PROFE	I) (OId) (CGPA ELF LEARNIN SSIONAL ETH	A) Exam IG (ALI IICS &	nination Nov/Dec-2019 L BRANCH) HUMAN VALUES	
Day & Time:	Date 02:30	e: Thursday, 19-) PM To 04:30 I	-12-2019 PM		Max. Marks: 5	0
Instru	ction	is: 1) Q.No.1 is	compulsory and	should	be solved in first 20 minutes in answe	эr
		book. 2) Figures to	o the right indicate	e full mar	rks.	
			MCQ/Objectiv	e Type (Questions	
Durati	on: 20	0 Minutes	•		Marks: 1	0
Q.1 (Choo	se the correct	alternatives from	m the or	ntions. 1	0
	1)	Courage is the a) elf-confide b) Risks and c) Physical cou d) Social cou	tendency to acce nce difficult tasks in r ourage rage	ept and fa	ace /ays	J
4	2)	Commitment m a) Alignment c) EMPATHY	ieans to goals ⁄	b) d)	Adherence to ethical principles All the above	
ć	3)	Morals are the a) Wise Peop c) Group of F	welfare principles ble People	s enuncia b) d)	ated by the Based on their experience None of Above	
2	4)	Ethics is the wo a) Human ter c) Only Value	ord that refers to ndency es	 b) d)	Morals, values, and beliefs Psychology	
Ę	5)	The study on e a) Learn good c) Morality	thics helps to kno d or bad things	ow the pe b) d)	eople's Copyright Beliefs, values, and morals	
(6)	What is Integrit a) Thought an c) Moral	y? nd words	b) d)	Honesty 15 years	
7	7)	Work ethics is a a) Motivation b) Set of attitute c) Attitude d) Values	defined as a	 with the v	value of work	
8	8)	Many complex a) Industry/ B c) Home	social problems e Business	exist in th b) d)	ne Society None of the above	
Q	9)	Virtues are a) Moral c) Values		b) d)	Ethics positive and preferred values	
	10)	Honesty is a a) Virtue c) T trustwort	thiness	b) d)	Truthfulness Communication	

Seat No.

Set R

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES

& Date: Thursday, 19-12-2019 e: 02:30 PM To 04:30 PM	Max. Marks: 40
r uctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks.	
What are the Objectives of Engineering Ethics?	10
What is the Difference Between Moral and Ethics? OR	10
What is Value and Types of Values.	10
 Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics 	20
r	 & Date: Thursday, 19-12-2019 a: 02:30 PM To 04:30 PM cuctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks. What are the Objectives of Engineering Ethics? What is the Difference Between Moral and Ethics? What is Value and Types of Values. Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics

e) vvork Etf) Virtues

Seat No.							Set	S
		T.E	E. (Part – I S) (Old) (CGPA) ELF LEARNING	Exan G (AL	nination Nov/Dec-201 L BRANCH)	9	
Day &	Date	e: Th	ursday, 19-1	12-2019 M	υσα	HUMAN VALUES	ax. Marks	: 50
Instru	uction	ns: 1) Q.No.1 is	compulsory and s	hould	be solved in first 20 minu	tes in ans	swer
		2)) Figures to	the right indicate f	ull ma	rks.		
			-	MCQ/Objective	Туре	Questions		
Durati	ion: 2	0 Mi	nutes	-			Marks	: 10
Q.1	Choo	ose t	he correct	alternatives from	the o	otions.		10
	1)	The	study on et	hics helps to know	the p	eople's		
		a)	Learn good	l or bad things	b)	Copyright		
		c)	Morality		d)	Beliefs, values, and mora	ls	
	2)	Wha	at is Integrity	/?	ه)	Llanaatu		
		a)	I nought an Moral	ia woras	(a (b	Honesty 15 years		
	3)	U) Wa	wording is a	lafinad as a	u)			
	3)	a)	Motivation		•			
		b)	Set of attitu	ides concerned wit	th the	value of work		
		c)	Attitude					
		d)	Values					
	4)	Mar	ny complex s	social problems ex	ist in t	he		
		a) c)	Home	usiness	(d (b	Society None of the above		
	5)	Virtı	les are		ч,			
	0)	a)	Moral		b)	Ethics		
		c)	Values		d)	positive and preferred val	lues	
	6)	Hon	esty is a	·				
		a)	Virtue		b)	Truthfulness		
		C)	I trustwort	niness	d)	Communication		
	7)	Cou	Irage is the t	tendency to accep	t and f	ace		
		a) h)	Risks and (ice difficult tasks in rat	ional v	waws		
		c)	Physical co	ourage		vayo		
		d)	Social cour	age				
	8)	Con	nmitment m	eans				
		a)	Alignment	to goals	b)	Adherence to ethical prine	ciples	
		C)	EMPATHY		d)	All the above		
	9)	Mor	als are the v	welfare principles e	enunci	ated by the		
		a)	Wise Peop	le	b)	Based on their experience	е	
		C)		eopie	a)	NOTE OF ADOVE		
	10)	Ethi	cs is the wo	rd that refers to	 ה)	Morale values and holist	fe	
		a) C)	Only Value	s	(u	Psychology	13	

c) Only Values

d) Psychology

SLR-FM-639



SLR-FM-6	39
Set	S
T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES	
& Date: Thursday, 19-12-2019 Max. Marks : 02:30 PM To 04:30 PM	: 40
uctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks.	
What are the Objectives of Engineering Ethics?	10
What is the Difference Between Moral and Ethics? OR	10
What is Value and Types of Values.	10
 Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics 	20
	SLR-FM-6 T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) PROFESSIONAL ETHICS & HUMAN VALUES & Date: Thursday, 19-12-2019 Max. Marks : 02:30 PM To 04:30 PM uctions: 1) All questions are compulsory. 2) Figure to the right indicates full marks. What are the Objectives of Engineering Ethics? What is the Difference Between Moral and Ethics? What is the Difference Between Moral and Ethics? What is Value and Types of Values. Write short notes on any four a) Moral b) Ethics c) Commitment d) Integrity e) Work Ethics

f) Virtues

Set

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In the designation of concrete mix, 'M' refers to the mix and the number to the specified compressive strength of '150mm' size cube at <u>'28 days'</u> expressed in _____ unit.
 - a) KN/mm^2 b) KN/m^2
 - c) N/mm^2 d) N/m^2
- If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be _____.
 - a) 0.3375 b) 0.337 c) 0.34 d) 0.33
- If thickness of concreting is less than 100mm, the concreting in RCC slab is measured in _____.

Sq.m

- a) Running m b)
- c) Cu.m d) None of the above

4) If the wall thickness is one and half brick thick, the brickwork is measured in .

- a) Running m b) Sq.m
 - c) Cu.m d) None of the above
- 5) The minimum number of layers for compaction of 0.60m deep plinth filling, shall be _____.
 - a) 1 b) 2 c) 3 d) 5
- 6) The estimate of property may be needed for _____.
 - a) Mortgage of property
 - b) Taxation
 - c) loan for construction of property
 - d) Calculating the compensation during land acquisition
- The valuation of property may be needed for _____.
 - a) Preparation of Estimate
 - b) Calculating the stamp duty of sale deed
 - c) Project planning
 - d) None of the above

Set

Max. Marks: 70

Marks: 14

SLR-FM-64

- 8) Escalation clause is provided to cover unexpected cost due to fluctuation in the prices of
 - a) raw material
 - c) contingencies
- 9) The lease is
 - Transferable, heritable, revocable a)
 - Transferable, revocable, non-heritable b)
 - c) Transferable, heritable, non-revocable
 - d) heritable, revocable, non- transferable
- Years purchase in perpetuity for highest rate of interest 2.5% will be, _____. 10)
 - a) 2.5 b) 100
 - c) 40 d) 25
- In long and short wall method of estimation, length of Short wall is centre 11) to centre distance between extreme opposite walls in shorter directions of ground floor plan
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side
- 12) Earnest money is paid to enable the Government to ensure that a tenderer does not
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
- 13) No deductions are required during the measurement of concreting work if area of opening is less than or equal to
 - a) 0.1 Sq.m. 0.5 Sq.m b)
 - c) 1.0 Sq.m d) 3.0 Sq.m
- 14) For RCC framed structures types of buildings, economic life shall be taken as below
 - 100 years a) b) c) 50 years
- 75 years d) 40 years

- b) **Overheads**
- d) work charged establishment



Set

Set

Ρ

04

Seat	
No.	

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

		Section – I	
Q.2	Pre follo a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of excavation as 1500mm.	04
Q.3	b) c) a)	Concreting for RCC footing in M20. Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated.	04 04 04
	b)	What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
Q.4	Wri a) b)	i te the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	80
Q.5	Caı a) d)	Try out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing	08
		Section – II	
Q.6	a) b)	Compare Item Rate Contract and Percentage Rate Contract. What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net	04

annual rent at 8% in perpetuity with Years Purchase. b) Differentiate between free hold and lease hold property.

- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

.....

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO.	1001192 8/2		-	COLU	UU		
A 400440000	LXB	0	POD RAD SILLS	SIZE	1 STEEL	STIRRUP	
42,44	1.20 X 1.45	0.400	MAIN 10 165 c/c. (08 NO) DISTRI 10 157 c/c. (07 NO)	200 X 450 200 X 350	10012	8MM@150c/cD	
C - 3,4,5,6,48,49, 50,51	1.05 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12 \$ 16 4 D 16 + 6 \$ 12	BMM@150c/cDi	
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@1506/cDC	
C - 10,20,23,28, 29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 0 160 c/c (09 NO) DISTRI 10 0 150 c/c (06 NO)	200 X 450	6016+2012 4016+2012	BMM@150cic.DC	
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 0 150 c/c (11 NO) DISTRI 10 0 150 c/c (09 NO)	200 X 530	6016+4612	8MM@150c/cD0	
C-13.14,17,18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c. (12 NO) DISTRI 10 # 135 c/c (10 NO)	200 X 600 200 X 530	6016+6012 2016+6012	8MM@150c/cDO	
0 - 21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 380 200 X 300	\$\$12 6@12	8MM@150c/cDO	
C - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 0 120 c/c (16 NO) DISTRI 10 120 c/c (14 NO)	300 X 530	8 # 16	BMM@150chDO	

06

06

SLR-FM-64 Set P



Seat	
No.	

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Escalation clause is provided to cover unexpected cost due to fluctuation in the prices of
 - a) raw material

b) **Overheads** d) work charged establishment

- c) contingencies
- 2) The lease is
 - a) Transferable, heritable, revocable
 - b) Transferable, revocable, non-heritable
 - c) Transferable, heritable, non-revocable
 - d) heritable, revocable, non- transferable
- Years purchase in perpetuity for highest rate of interest 2.5% will be, _____. 3)
 - a) 2.5 b) 100
 - d) c) 40 25
- In long and short wall method of estimation, length of Short wall is centre 4) to centre distance between extreme opposite walls in shorter directions of ground floor plan
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side
- 5) Earnest money is paid to enable the Government to ensure that a tenderer does not
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
- 6) No deductions are required during the measurement of concreting work if area of opening is less than or equal to .
 - a) 0.1 Sq.m. 0.5 Sq.m b)
 - c) 1.0 Sq.m d) 3.0 Sq.m
- 7) For RCC framed structures types of buildings, economic life shall be taken as below ____
 - a) 100 years 75 years b) c) 50 years
 - d) 40 years



Max. Marks: 70

Set 8) In the designation of concrete mix, 'M' refers to the mix and the number to the specified compressive strength of '150mm' size cube at '28 days' expressed in _____ unit. a) KN/mm² KN/m² b) N/mm² d) N/m^2 c) If rise and tread of a step is 0.15m and 0.25m respectively, then the 9) volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be 0.337 a) 0.3375 b) d) 0.33 c) 0.34 10) If thickness of concreting is less than 100mm, the concreting in RCC slab is measured in a) Running m b) Sq.m c) Cu.m d) None of the above 11) If the wall thickness is one and half brick thick, the brickwork is measured in Running m Sq.m b) a) c) Cu.m d) None of the above The minimum number of layers for compaction of 0.60m deep plinth filling, 12) shall be _____. 1 b) a) 2 3 d) 5 c) 13) The estimate of property may be needed for _____. Mortgage of property a) b) Taxation c) loan for construction of property d) Calculating the compensation during land acquisition The valuation of property may be needed for _____. 14)

- a) Preparation of Estimate
- b) Calculating the stamp duty of sale deed
- c) Project planning
- d) None of the above

SLR-FM-64

04

Seat	
No.	

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

		Section – I	
Q.2	Pre follo a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of excavation as 1500mm	04
	b)	Concreting for RCC footing in M20.	04
Q.3	c) a)	Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated.	04 04
	b)	What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
Q.4	Wri a) b)	te the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	08
Q.5	Car a) d)	rry out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing	08
		Section – II	
Q.6	a) b)	Compare Item Rate Contract and Percentage Rate Contract. What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net annual rent at 8% in perpetuity with Years Purchase.	04

b) Differentiate between free hold and lease hold property.



- Q.9 An old building has been purchases by a person at a cost of Rs. a) 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - What is the valuation of a property in 2019, with following details of a b) building? Assume 10% scrap value at the end of useful life.

.....

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO	1001049-825		T	1 //w - BIN		and the second second	
	LXB	D	FCOTING STIEL	6175	1 CTER	STIPPINS	
C-1,2,9,11,25,31, 42,44	1.20 X 1,45	0,400	MAIN 10 0 165 c/c (08 NO) DISTRI 10 0 157 c/c (07 NO)	200 X 450	10012 8012	SMM@150c/cD	
C - 3,4,5,6,48,49, 50,51	1.95 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12012	BMM@150c/cDi	
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@ 1506/cDC	
C - 10,20,23,28, 29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 @160 c/c (09 NO) DISTRI 10 @ 150 c/c (05 NO)	200 X 450	6016+2012 4016-2012	BMM@150c/cDC	
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 0 150 c/c (11 NO) DISTRI 10 0 150 c/c (09 NO)	200 X 530	6016+4012 4016+4012	8MM@ 1500/cDO	
C - 13.14,17,18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c. (12 NO) DISTRI 10 # 135 c/c (10 NO)	200 X 600 200 X 530	6016+6012 2016+8012	8MM@150c/cDO	
C-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 390 200 X 300	\$₹12 6€12	8MM@150c/cD0	
C - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 0 120 c/c (16 NO) DISTRI 100 120 c/c (14 NO)	300 X 530	8 Ø 16 6 Ø 16	8MM@150chDO	

06

06

SLR-FM-64 Set Q



Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Duration: 30 Minutes

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) The minimum number of layers for compaction of 0.60m deep plinth filling, shall be _____.
 - a) 1 2 b)
 - c) 3 d) 5
- 2) The estimate of property may be needed for .
 - a) Mortgage of property
 - b) Taxation
 - c) loan for construction of property
 - d) Calculating the compensation during land acquisition
- The valuation of property may be needed for _____. 3)
 - a) Preparation of Estimate
 - b) Calculating the stamp duty of sale deed
 - Project planning c)
 - d) None of the above
- 4) Escalation clause is provided to cover unexpected cost due to fluctuation in the prices of
 - a) raw material
 - c) contingencies

- b) Overheads
- d) work charged establishment

- The lease is 5)
 - a) Transferable, heritable, revocable
 - b) Transferable, revocable, non-heritable
 - Transferable, heritable, non-revocable c)
 - d) heritable, revocable, non- transferable
- Years purchase in perpetuity for highest rate of interest 2.5% will be, _____. 6)
 - a) 2.5 b) 100
 - 40 d) c) 25
- In long and short wall method of estimation, length of Short wall is centre 7) to centre distance between extreme opposite walls in shorter directions of ground floor plan
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side

Set R

Max. Marks: 70

Set R

- Earnest money is paid to enable the Government to ensure that a tenderer does not _____.
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
- No deductions are required during the measurement of concreting work if area of opening is less than or equal to _____.
 - a) 0.1 Sq.m. b) 0.5 Sq.m
 - c) 1.0 Sq.m d) 3.0 Sq.m
- 10) For RCC framed structures types of buildings, economic life shall be taken as below _____.
 - a) 100 years b) 75 years
 - c) 50 years d) 40 years
- 11) In the designation of concrete mix, 'M' refers to the mix and the number to the specified compressive strength of '150mm' size cube at <u>'28 days'</u> expressed in _____ unit.
 - a) KN/mm^2 b) KN/m^2
 - c) N/mm^2 d) N/m^2
- 12) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be _____.
 - a) 0.3375 b) 0.337 c) 0.34 d) 0.33
- 13) If thickness of concreting is less than 100mm, the concreting in RCC slab is measured in _____.
 - a) Running m
- b) Sq.m
 - d) None of the above
- 14) If the wall thickness is one and half brick thick, the brickwork is measured
 - in ____.

c) Cu.m

- a) Running m
- c) Cu.m

- b) Sq.m
- d) None of the above

04

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

Section – I

		Section – I	
Q.2	Pre folle a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of excavation as 1500mm.	04
	b)	Concreting for RCC footing in M20.	04
Q.3	c) a)	Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated.	04 04
	b)	What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
Q.4	Wr a) b)	ite the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	08
Q.5	Ca a) d)	r ry out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing	08
		Section – II	
Q.6	a) b)	Compare Item Rate Contract and Percentage Rate Contract. What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net annual rent at 8% in perpetuity with Years Purchase.	04

b) Differentiate between free hold and lease hold property.

Set R

- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

Nº 1 - 1. 1 . . .

Sr. No	Description	Area (Sq.M)	Rate Rs/SqM	Total life (year)	Built in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO.	10000	0.922	CONTRACT OF C	1 60.0	04	
A 490440554	LAB	0	Province 2:015	SIZE	1 STEEL	STIRRUP
42,44	1.20 X 1.45	0.400	MAIN 10 # 165 c/c. (08 NO) DISTRI 10 # 157 c/c. (07 NO)	200 X 450 200 X 350	10012	SMM@150c/cD
C - 3,4,5,6,48,49, 50,51	1.05 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12 \$ 16 4 D 16 + 6 \$ 10	BMM@150c/cD
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@ 1506/cD0
C - 10,20,23,28, 29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 0 160 c/c (09 NO) DISTRI 10 0 150 c/c (06 NO)	200 X 450	6016+2012 1016+2012	BMM@150pic.DC
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 \$ 150 c/c. (11 NO) DISTRI 10 \$ 150 c/c (09 NO)	200 X 530	6015+4012	8MM@1506/cDX
C - 13.14.17.18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c. (12 NO) DISTRI 10 # 135 c/c. (10 NO)	200 X 500 200 X 530	6016+6012 2016+6012	8MM@150c/cDC
C-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 380 200 X 300	\$₹12 6€12	8MM@150c/cDC
C - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 9,120 c/c (16 NO) DISTRI 10 9 120 c/c (14 ND)	300 X 530	8 Ø 16 6 Ø 16	8MM@150c/cDO

06

SLR-FM-64 Set R



B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - 1) Years purchase in perpetuity for highest rate of interest 2.5% will be, _____.
 - a) 2.5 b) 100
 - c) 40 d) 25
 - 2) In long and short wall method of estimation, length of Short wall is centre to centre distance between extreme opposite walls in shorter directions of ground floor plan ___.
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side
 - Earnest money is paid to enable the Government to ensure that a tenderer 3) does not
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
 - 4) No deductions are required during the measurement of concreting work if area of opening is less than or equal to
 - 0.5 Sq.m a) 0.1 Sq.m. b)
 - c) 1.0 Sq.m d) 3.0 Sq.m
 - For RCC framed structures types of buildings, economic life shall be taken 5) as below _.
 - a) 100 years 75 years b)
 - 40 years c) 50 years d)
 - In the designation of concrete mix, 'M' refers to the mix and the number to 6) the specified compressive strength of '150mm' size cube at '28 days' expressed in unit.
 - KN/m² a) KN/mm² b) N/m² c) N/mm² d)
 - 7) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be
 - a) 0.3375 b) 0.337 0.33
 - c) 0.34 d)

Max. Marks: 70

Marks: 14

- 8) If thickness of concreting is less than 100mm, the concreting in RCC slab is measured in b) Sq.m
 - a) Running m
 - c) Cu.m d) None of the above
- 9) If the wall thickness is one and half brick thick, the brickwork is measured in
 - a) Running m b) Sq.m c) Cu.m d) None of the above
- The minimum number of layers for compaction of 0.60m deep plinth filling, 10) shall be _____.
 - 2 a) 1 b)
 - c) 3 d) 5
- 11) The estimate of property may be needed for _____.
 - a) Mortgage of property
 - b) Taxation
 - c) loan for construction of property
 - d) Calculating the compensation during land acquisition
- The valuation of property may be needed for _____. 12)
 - a) Preparation of Estimate
 - b) Calculating the stamp duty of sale deed
 - c) Project planning
 - d) None of the above
- Escalation clause is provided to cover unexpected cost due to fluctuation 13) in the prices of _____
 - a) raw material

b) Overheads

c) contingencies

d) work charged establishment

- 14) The lease is
 - a) Transferable, heritable, revocable
 - b) Transferable, revocable, non-heritable
 - c) Transferable, heritable, non-revocable
 - d) heritable, revocable, non- transferable

Set

SLR-FM-64

04

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

Section – I

Q.2	Pre folle	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22	
	a)	Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of excavation as 1500mm	04
	b)	Concreting for RCC footing in M20.	04
	c)	Concreting in M7.5 for PCC 100mm thick under footing.	04
Q.3	a) b)	Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated. What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
04	Wr	ite the detailed specifications for	08
4 .7	a) b)	Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	00
Q.5	Ca	rry out Rate analysis for the following items	08
	a) d)	Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing	
		Section – II	
Q.6	a) b)	Compare Item Rate Contract and Percentage Rate Contract. What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net	04

annual rent at 8% in perpetuity with Years Purchase.b) Differentiate between free hold and lease hold property.



- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

Nº 1 - 1. 1 . . .

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO.	1001042 322		SZADANO DITEZ	COLINY			
P 420440504	LAB	0	COMPAGE STELL	SIZE	1 STEEL	STIRRUPS	
42,44	1.20 X 1.45	0.400	MAIN 10 165 c/c. (08 NO) DISTRI 10 157 c/c. (07 NO)	200 X 450 200 X 350	10012	SMM@150c/cD	
C - 3,4,5,6,48,49, 50,51	1.05 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12#16 4 0 16 + 6 5 12	BMM@150c/cDi	
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 \$ 150 c/c (10 NO) DISTRI 10 \$ 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@ 1506/cDC	
29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 0 160 c/c (09 NO) DISTRI 10 0 150 c/c (06 NO)	200 X 450 200 X 390	6016+2012	BMM@150pic.DC	
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 0 150 c/c (11 NO) DISTRI 10 0 150 c/c (09 NO)	200 X 530	6016+4012 4016+4012	8MM@ 150c/cDC	
C-13.14,17,18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c (12 NO) DISTRI 10 # 135 c/c (10 NO)	200 X 600 200 X 530	6016+6012 2016+8012	8MM@150c/cDC	
0-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 390 200 X 300	\$₫ 12 6 @ 12	8MM@150c/cD0	
C - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 0,120 c/c (16 NO) DISTRI 100 120 c/c (14 NO)	300 X 530	8 Ø 16 6 Ø 16	8MM@150c/cDO	

06

SLR-FM-64 Set S



Set No.

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) **ECONOMICS**

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

Duration: 20 Minutes

- Microeconomic theory deals with 1)
 - Economic behavior of individual economic decision making units a)
 - Economy as whole b)
 - Trade relations c)
 - d) Economic growth of the society
- 2) In a mixed economy which sector (s) is / are found
 - Private only Public only a) b)
 - None c) d)
- Who is known as father of economics? 3)
 - Adam Smith a) b) C) Alfred Marshall
- 4) Which of these is an economic activity?
 - Father teaching his son at home instead of spending on coaching a)
 - A housewife making food for the family on her own b)
 - A hair dresser doing hair cut designing on payment c)
 - A singer giving a show on his son's wedding anniversary d)
- Which of the following is true with respect to the law of diminishing 5) marginal utility?
 - The more the consumption, lesser the marginal utility from every a) additional unit consumed
 - The more the consumption, the greater the marginal utility from every b) additional unit consumed
 - The lesser the consumption, the lesser the marginal utility from every c) additional unit consumed
 - The lesser the consumption, no marginal utility from every additional d) unit consumed
- Which of the following is NOT an account in the Balance of Payments? 6)
 - Current Account Capital Account b) a)
 - Future Account C) **Financial Account** d)

- Prof. A. Samulson

- J. R. Hicks d)





Max. Marks: 50

SLR-FM-640

Marks: 10

10

- 7) The MPC can be defined as that fraction of a _____.
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - c) Given total income that is not consumed
 - d) Given total income that is consumed
- 8) Which of the following market structures has a predominant feature of price leadership?
 - a) Perfectly competitivec) Oligopoly
- b) Monopoly
- d) Monopolistic competitive

Set

- 9) Average revenue is _____.
 - a) Total revenue divided by the number of units sold
 - b) Revenue earned by all the units of the output
 - c) Revenue earned by the average sized firm in the industry
 - d) Net addition made to the total revenue by selling one more unit of a commodity
- 10) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _____.
 - a) The GDP of India and GNP of USA
 - b) Indian GNP and USA's GDP
 - c) India's GDP and USA's GDP
 - d) Indian GNP and USA's GNP

	ECONOMICS	
Day Time	& Date: Thursday, 19-12-2019 9: 02:30 PM To 04:30 PM	Max. Marks: 40
Instr	uctions: 1) Attempt any four questions out of question no. two to sever 2) Figures at right indicate marks.	n.
Q.2	Write short notes.a) Positive and Normative Economicsb) Saving and investment	10
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade	10
Q.4	Discuss the role of state government in economic activity.	10
Q.5	Explain the properties of perfect and imperfectly competitive market.	10
Q.6	What is mean by consumption? Illustrate the determinants of consumption	ption. 10
Q.7	Define central bank, discuss the function of central banking in India.	10

Set P

Seat No.

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch)

Set

Max. Marks: 50

Set No.

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) Which of the following is NOT an account in the Balance of Payments?
 - a) Current Accountc) Financial Account
- b) Capital Account
- d) Future Account
- 2) The MPC can be defined as that fraction of a _____.
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - c) Given total income that is not consumed
 - d) Given total income that is consumed
- 3) Which of the following market structures has a predominant feature of price leadership?
 - a) Perfectly competitivec) Oligopoly
- b) Monopolyd) Monopolistic competitive
- 4) Average revenue is ____
 - a) Total revenue divided by the number of units sold
 - b) Revenue earned by all the units of the output
 - c) Revenue earned by the average sized firm in the industry
 - d) Net addition made to the total revenue by selling one more unit of a commodity
- 5) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _____.
 - a) The GDP of India and GNP of USA
 - b) Indian GNP and USA's GDP
 - c) India's GDP and USA's GDP
 - d) Indian GNP and USA's GNP
- 6) Microeconomic theory deals with _____
 - a) Economic behavior of individual economic decision making units
 - b) Economy as whole
 - c) Trade relations
 - d) Economic growth of the society
- 7) In a mixed economy which sector (s) is / are found _____
 - a) Private only
 - c) None

- b) Public only
- d) Both (a) private (b) public

10

Marks: 10

SLR-FM-640 Set C

- Who is known as father of economics? 8)
 - Adam Smith a)

- Prof. A. Samulson b)
- Alfred Marshall c)
- J. R. Hicks d)
- Which of these is an economic activity? 9)
 - Father teaching his son at home instead of spending on coaching a)
 - A housewife making food for the family on her own b)
 - A hair dresser doing hair cut designing on payment C)
 - A singer giving a show on his son's wedding anniversary d)
- 10) Which of the following is true with respect to the law of diminishing marginal utility?
 - The more the consumption, lesser the marginal utility from every a) additional unit consumed
 - The more the consumption, the greater the marginal utility from every b) additional unit consumed
 - The lesser the consumption, the lesser the marginal utility from every c) additional unit consumed
 - The lesser the consumption, no marginal utility from every additional d) unit consumed

I.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS				
Day a Time	& Date: Thursday, 19-12-2019	Vax. Marks: 40		
Instr	Fuctions: 1) Attempt any four questions out of question no. two to seven2) Figures at right indicate marks.			
Q.2	Write short notes.a) Positive and Normative Economicsb) Saving and investment	10		
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade	10		
Q.4	Discuss the role of state government in economic activity.	10		
Q.5	Explain the properties of perfect and imperfectly competitive market.	10		
Q.6	What is mean by consumption? Illustrate the determinants of consumption	tion. 10		
Q.7	Define central bank, discuss the function of central banking in India.	10		

Set Q

Seat No.

Set

Max. Marks: 50

Set No.

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) Average revenue is ____
 - a) Total revenue divided by the number of units sold
 - b) Revenue earned by all the units of the output
 - c) Revenue earned by the average sized firm in the industry
 - d) Net addition made to the total revenue by selling one more unit of a commodity
- 2) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _____.
 - a) The GDP of India and GNP of USA
 - b) Indian GNP and USA's GDP
 - c) India's GDP and USA's GDP
 - d) Indian GNP and USA's GNP
- 3) Microeconomic theory deals with ____
 - a) Economic behavior of individual economic decision making units
 - b) Economy as whole
 - c) Trade relations

Private only

None

a) c)

- d) Economic growth of the society
- 4) In a mixed economy which sector (s) is / are found _____
 - b) Public only
 - d) Both (a) private (b) public
- 5) Who is known as father of economics?
 - a) Adam Smith b) Prof. A. Samulson
 - c) Alfred Marshall d) J. R. Hicks
- 6) Which of these is an economic activity?
 - a) Father teaching his son at home instead of spending on coaching
 - b) A housewife making food for the family on her own
 - c) A hair dresser doing hair cut designing on payment
 - d) A singer giving a show on his son's wedding anniversary

Marks: 10

10

Page 8 of 12

- 7) Which of the following is true with respect to the law of diminishing marginal utility?
 - a) The more the consumption, lesser the marginal utility from every additional unit consumed
 - b) The more the consumption, the greater the marginal utility from every additional unit consumed
 - c) The lesser the consumption, the lesser the marginal utility from every additional unit consumed
 - d) The lesser the consumption, no marginal utility from every additional unit consumed
- 8) Which of the following is NOT an account in the Balance of Payments?
 - a) Current Account b) Capita
 - c) Financial Account d) Fu
- 9) The MPC can be defined as that fraction of a _____.
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - c) Given total income that is not consumed
 - d) Given total income that is consumed
- 10) Which of the following market structures has a predominant feature of price leadership?
 - a) Perfectly competitive
 - c) Oligopoly

- b) Monopoly
- d) Monopolistic competitive



SLR-FM-640

Set R

b) Capital Account

d) Capital Account
 d) Future Account
Seat No.		Set	R
	T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS		
Day & Time:	& Date: Thursday, 19-12-2019 Max : 02:30 PM To 04:30 PM	. Marks	s: 40
Instru	uctions: 1) Attempt any four questions out of question no. two to seven.2) Figures at right indicate marks.		
Q.2	Write short notes.a) Positive and Normative Economicsb) Saving and investment		10
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade		10
Q.4	Discuss the role of state government in economic activity.		10
Q.5	Explain the properties of perfect and imperfectly competitive market.		10
Q.6	What is mean by consumption? Illustrate the determinants of consumption		10
Q.7	Define central bank, discuss the function of central banking in India.		10

SLR-FM-640

SLR-FM-640

Set

Max. Marks: 50

Set No.

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book

2) Figures at right indicate marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) Who is known as father of economics?
 - a) Adam Smith b)
 - c) Alfred Marshall d) J. R. Hicks
- 2) Which of these is an economic activity?
 - a) Father teaching his son at home instead of spending on coaching
 - b) A housewife making food for the family on her own
 - c) A hair dresser doing hair cut designing on payment
 - d) A singer giving a show on his son's wedding anniversary
- 3) Which of the following is true with respect to the law of diminishing marginal utility?
 - a) The more the consumption, lesser the marginal utility from every additional unit consumed
 - b) The more the consumption, the greater the marginal utility from every additional unit consumed
 - c) The lesser the consumption, the lesser the marginal utility from every additional unit consumed
 - d) The lesser the consumption, no marginal utility from every additional unit consumed
- 4) Which of the following is NOT an account in the Balance of Payments?
 - a) Current Account b) Capital Account
 - c) Financial Account d) Future Account
- 5) The MPC can be defined as that fraction of a _____.
 - a) Change in income that is not consumed
 - b) Change in income that is consumed
 - c) Given total income that is not consumed
 - d) Given total income that is consumed
- 6) Which of the following market structures has a predominant feature of price leadership?
 - a) Perfectly competitive
 - c) Oligopoly

- b) Monopoly
- d) Monopolistic competitive

Prof. A. Samulson

Marks: 10

- 7) Average revenue is _____.
 - a) Total revenue divided by the number of units sold
 - b) Revenue earned by all the units of the output
 - c) Revenue earned by the average sized firm in the industry
 - d) Net addition made to the total revenue by selling one more unit of a commodity
- 8) Mr. Amol an Indian Citizen is working for an Indian MNC in USA. The income earned by Amol is part of _____.
 - a) The GDP of India and GNP of USA
 - b) Indian GNP and USA's GDP
 - c) India's GDP and USA's GDP
 - d) Indian GNP and USA's GNP
- 9) Microeconomic theory deals with _____.
 - a) Economic behavior of individual economic decision making units
 - b) Economy as whole
 - c) Trade relations

Private only

- d) Economic growth of the society
- 10) In a mixed economy which sector (s) is / are found _____.
 - b) Public only

c) None

a)

d) Both (a) private (b) public

SLR-FM-640

Set S

Q.2	 Write short notes. a) Positive and Normative Economics b) Saving and investment 	10				
Q.3	Write short notes.a) Importance of Money in the economyb) International Trade	10				
Q.4	Discuss the role of state government in economic activity.	10				
Q.5	Explain the properties of perfect and imperfectly competitive market.	10				
Q.6	What is mean by consumption? Illustrate the determinants of consumption.					
Q.7	Define central bank, discuss the function of central banking in India.	10				

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) ECONOMICS Day & Date: Thursday, 19-12-2019 Max

Instructions: 1) Attempt any four questions out of question no. two to seven.

2) Figures at right indicate marks.

SLR-FM-640

Time: 02:30 PM To 04:30 PM

Seat

No.

Set S

Max. Marks: 40

No.								Set	Ρ
		T.I	E (Part – I) (Old) (CGP Self Learn STRES	A) Exa ing (A S & C	ami All E OP	nation Nov/Dec-2019 Branch) ING	1	
Day Time	Day & Date: Thursday, 19-12-2019Max. Marks: 50Time: 02:30 PM To 04 :30 PM								
Instr	Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book.								
		-	-) i igulo to i	MCQ/Object	ive Tvr	ne Q	uestions		
Dura	ition: 2	20 Mi	nutes					Mark	s: 10
Q.1	Choo 1)	ose f Ach sym a) c)	t he correct es, shallow ptoms of sti Physical Emotional	alternatives fr breathing and s ress.	om the sweatin	e opi g, fr b) d)	ions . equent colds are Behavioral Cognitive		10
	2)	Whi a) c)	ch one is no It improves It motivates	ot a characterist performance	ics of F	Posit b) d)	ive Stress? It feels exciting It's frustrating		
	3)	mult a) c)	deals wit tiple job den Physical E: Wellness F	h prioritizing & nands. xercise Programs	schedu	ıling b) d)	the activities to cope up w Time Management Relaxation	<i>v</i> ith	
	4)	Whi a) c)	ch one is no Weather Financial p	ot an environme roblems	ental str	esso b) d)	or? Traffic Substandard housing		
	5)	Folle a) c)	owing are th Unemployn Divorce	e examples of nent	negativ	ve sti b) d)	ressors. Legal problems All of the above		
	6)	Whi a) c)	ch of the fol Birthday Spouse de	lowing is a strea	ssful ev	/ent´ b) d)	? Studying Vacation		
	7)	Stre a) c)	ess which is Eustress Resistance	healthy for orga	anisatio	on or b) d)	for the individual is known Distress None of these	ו as	
	8)	Stre a) c)	ess is a norm Feels upse Boring	nal physical res et	ponset	to ev b) d)	ents that make a person <u>.</u> Excited Happy		
	9)	a) c)	is regar Hans Selye Atkinson P	ded as father o e otter	f stress	s res b) d)	earch. Sigmund Freud Mrunal Sengupta		
	10)	a) c)	is an or Job enlarg Job redesi	ganizational wa ement gn	ay of ma	anag b) d)	jing stress. Jogging Meditation		

SLR-FM-641 Set P

Seat

Sea No.	t	Set P					
	T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING						
Day Time	& Date: Thursday, 19-12-2019 e: 02:30 PM To 04 :30 PM	Max. Marks: 40					
Instr	Tuctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.						
Q.2	Individual can also manage stress on their own. Explain.	10					
Q.3	Explain in detail various sources of stress.	10					
Q.4	Whether optimal stress can be effective. Explain this statement.	10					
Q.5	Highlight the role of social support in minimizing the effects of stress.	10					
Q.6	Define stress and state the current and historical status of stress.						
Q.7	Explain the nature of stress response.	10					

SLR-FM-641

Г

No.	-						÷	Set	Q
		T.E (Par	t — I)	(Old) (CGP Self Learr STRES	PA) Ex ning (A SS & C	ami All B COP	nation Nov/Dec-2019 Branch) ING		
Day Time	& Date : 02:3	e: Thursday 0 PM To 04	, 19-1 ⊧:30 F	2-2019 PM			Max. I	Marks	3: 50
Insti	uctio	ns: 1) Q.No book	.1 is c	compulsory an	id shoul	ld be	solved in first 20 minutes in	answ	er
		2) Figur	e to ti	ne right indica	tes full i	mark	S.		
Dura	tion: C	0 Minutes			live Typ	be Q	uestions	Marke	· 10
0 1	Cho	ose the cou	rect :	alternatives f	rom the	e ont	ions	viaina	. 10 10
_	1)	Which of th a) Birthd c) Spous	ne foll ay se dea	owing is a stre	essful ev	vent? b) d)	Studying Vacation		
	2)	Stress which a) Eustre c) Resis	ch is ł ess tance	nealthy for org	anisatio	on or b) d)	for the individual is known as Distress None of these	<u>} </u>	<u> </u> .
	3)	Stress is a a) Feels c) Boring	norm upset	al physical res t	sponse	to ev b) d)	rents that make a person Excited Happy	<u> </u> .	
	4)	a) Hans c) Atkins	regaro Selye son Po	ded as father o e otter	of stress	s res b) d)	earch. Sigmund Freud Mrunal Sengupta		
	5)	a) Job e c) Job re	an org nlarge edesig	ganizational w ement jn	ay of m	anag b) d)	ing stress. Jogging Meditation		
	6)	Aches, sha symptoms a) Physic c) Emoti	allow b of stre cal onal	preathing and ess.	sweatir	ng, fro b) d)	equent colds are Behavioral Cognitive		
	7)	Which one a) It impr c) It moti	is not oves vates	t a characteris performance	tics of F	Positi b) d)	ive Stress? It feels exciting It's frustrating		
	8)	dea multiple jot a) Physic c) Wellne	ls with o dem cal Ex ess Pl	n prioritizing & ands. ærcise rograms	schedu	uling b) d)	the activities to cope up with Time Management Relaxation		
	9)	Which one a) Weath c) Finan	is not ner cial pr	t an environme oblems	ental sti	resso b) d)	or? Traffic Substandard housing		
	10)	Following a a) Unem c) Divord	are the ploym :e	e examples of ient	negativ	/e sti b) d)	essors. Legal problems All of the above		

SLR-FM-641 Set 0

Sea No.	t	Set Q					
	T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING						
Day Time	& Date: Thursday, 19-12-2019 :: 02:30 PM To 04 :30 PM	Max. Marks: 40					
Instr	uctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.						
Q.2	Individual can also manage stress on their own. Explain.	10					
Q.3	Explain in detail various sources of stress.	10					
Q.4	Whether optimal stress can be effective. Explain this statement.	10					
Q.5	Highlight the role of social support in minimizing the effects of stress.	10					
Q.6	Define stress and state the current and historical status of stress.						
Q.7	Explain the nature of stress response.	10					

SLR-FM-641

Day Time	& Dat e: 02:3	e: Thursday, 19-12-2019 80 PM To 04 :30 PM		Max.	Marks: 50
Inst	ructio	ns: 1) Q.No.1 is compulsory and shou book.	uld be	e solved in first 20 minutes ir	answer
		2) Figure to the right indicates full	marl	(S.	
		MCQ/Objective Ty	vpe Q	uestions	
Dura	ation: 2	20 Minutes			Marks: 10
Q.1	Cho	ose the correct alternatives from th	e op	tions.	10
	')	 a) Hans Selye c) Atkinson Potter 	b) d)	Sigmund Freud Mrunal Sengupta	
	2)	is an organizational way of n a) Job enlargement c) Job redesign	nana(b) d)	ging stress. Jogging Meditation	
	3)	Aches, shallow breathing and sweati symptoms of stress.a) Physicalc) Emotional	ng, fr b) d)	equent colds are Behavioral Cognitive	
	4)	Which one is not a characteristics of a) It improves performance c) It motivates	Posit b) d)	ive Stress? It feels exciting It's frustrating	
	5)	 deals with prioritizing & sched multiple job demands. a) Physical Exercise c) Wellness Programs 	luling b) d)	the activities to cope up with Time Management Relaxation	ז
	6)	Which one is not an environmental s a) Weather c) Financial problems	tress b) d)	or? Traffic Substandard housing	
	7)	Following are the examples of negata) Unemploymentc) Divorce	ive st b) d)	ressors. Legal problems All of the above	
	8)	Which of the following is a stressful ea) Birthdayc) Spouse death	event b) d)	? Studying Vacation	
	9)	Stress which is healthy for organisati a) Eustress c) Resistance	ion or b) d)	for the individual is known a Distress None of these	as
	10)	Stragg is a normal physical response	to o	ionto that make a paraon	

T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Self Learning (All Branch) STRESS & COPING

Seat

No.

- Stress is a normal physical response to events that make a person _____. 10)
 - a) Feels upset b) Excited Happy
 - c) Boring d)

SLR-FM-641

Set R

Sea No.	t	Set R					
	T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING						
Day & Date: Thursday, 19-12-2019 Max. Time: 02:30 PM To 04 :30 PM							
Instr	uctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.						
Q.2	Individual can also manage stress on their own. Explain.	10					
Q.3	Explain in detail various sources of stress.	10					
Q.4	Whether optimal stress can be effective. Explain this statement.	10					
Q.5	Highlight the role of social support in minimizing the effects of stress.	10					
Q.6	Define stress and state the current and historical status of stress.						
Q.7	Explain the nature of stress response.	10					

SLR-FM-641

Set T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04 :30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 20 minutes in answer book.

Self Learning (All Branch) **STRESS & COPING**

2) Figure to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

2)

Seat

No.

Q.1 Choose the correct alternatives from the options.

- _ deals with prioritizing & scheduling the activities to cope up with 1) multiple job demands. b) Time Management
 - **Physical Exercise** a)
 - Wellness Programs c)
 - Which one is not an environmental stressor?
 - Weather b) a) c) Financial problems d)

3) Following are the examples of negative stressors.

- Unemployment a) b) Divorce c)
- Which of the following is a stressful event? 4)
 - Birthday a)
 - Spouse death C) d)
- Stress which is healthy for organisation or for the individual is known as _____. 5)
 - a) Eustress b) Distress
 - c) Resistance d) None of these

6) Stress is a normal physical response to events that make a person _____.

Feels upset Excited a) b) c) Boring d) Happy

7) is regarded as father of stress research.

Hans Selve

a)

- c) Atkinson Potter d) Mrunal Sengupta
- is an organizational way of managing stress. 8)
 - Job enlargement a) b) Jogging Meditation c)
 - Job redesign d)
- 9) Aches, shallow breathing and sweating, frequent colds are _____ symptoms of stress.
 - a) Physical **Behavioral** b) Emotional d) Cognitive c)
- Which one is not a characteristics of Positive Stress? 10)
 - It improves performance a)
 - It motivates d) It's frustrating c)

Marks: 10

10

Max. Marks: 50

SLR-FM-641

Substandard housing

Legal problems

Sigmund Freud

It feels exciting

All of the above d)

Relaxation

Traffic

- Studying
- Vacation
- b)

b)

b)

d)

Seat No.		Set	S				
	T.E (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Self Learning (All Branch) STRESS & COPING						
Day & Time:	& Date: Thursday, 19-12-2019 : 02:30 PM To 04 :30 PM	Max. Marks	s: 40				
Instru	uctions: 1) Solve any 4 from Q. No. 2 to Q. No. 7. 2) Figure to the right indicates full marks.						
Q.2	Individual can also manage stress on their own. Explain.		10				
Q.3	Explain in detail various sources of stress.		10				
Q.4	Whether optimal stress can be effective. Explain this statement.		10				
Q.5	Highlight the role of social support in minimizing the effects of stress.		10				
Q.6	Define stress and state the current and historical status of stress.						
Q.7	Explain the nature of stress response.		10				

SLR-FM-641

		T.E	E. (Part – I) (Old) (CBCS) Ex Self Learning (/	ami All P	nation Nov/Dec-2019 Branch)
	I	NTE	ELLECTUAL PROPERTY RI DEVELOPMENT AND	GHI MA	
Day Time	& Date : 02:3	e: Th 0 PN	ursday, 19-12-2019 1 To 04:30 PM		Max. Marks: 50
Instr	uctio	n s: 1 2) Q. No. 1 is compulsory and sho book. 2) Figures al right indicate full ma	ould b	be solved in first 20 minutes in answer
		_	MCQ/Objective Tv	be Q	uestions
Dura	tion: 2	20 Mi	nutes		Marks: 10
Q.1	Cho 1)	ose t The a) c)	the correct alternatives from the first Patent Law was enacted in I 1856 1905	e opt ndia b) d)	tions. 10 in the year 1880 1850
	2)	The Tecl a) b) c) d)	legislation covering intellectual p hnology is Information Technology Act 2003 Information Technology Act 2000 Information Technology Act 2008 None of these	ropeı } }	ty right in India for Information
	3)	Wha a) c)	at is copyright meant for? Film work Essay	b) d)	Books All of these
	4)	Wha a) c)	at is the term of Patent? 35 years 20 years	b) d)	25 years 15 years
	5)	Intel that a) c)	llectual Property Rights (IPR) prot are of Ethical value Social value	ect tl b) d)	he use of information and ideas Moral value Commercial value
	6)	The a) c)	following can be patented Machine Composition of matter	b) d)	Process All of these
	7)	The othe a) c)	following can not be exploited by ers Patents Trademark	assi b) d)	gning or by licensing the rights to Designs All of these
	8)	Wha a) c)	at protects the intellectual property Copyright Trademarks	/ crea b) d)	ated by artists? Patents Registered Designs

SLR-FM-642

Set P

Seat No.

SLR-FM-642 Set P

- 9) If a company develops a new technology that improves its main product, what type of intellectual property can they use to stop others from copying their invention?
 - a) Copyright

b) Patents

c) Trademarks

- d) Registered Designs
- 10) All of the following are examples of intellectual property protections except _____.
 - a) Copyrights

b) Patents

c) Contracts

d) Trademarks

_ _ _

Seat No.	t					Set	Ρ
		T.E. (Part – I INTELLECTUA DE\) (Old) (CBCS Self Learnir L PROPERT ELOPMENT) Examination g (All Branch (RIGHTS FOF AND MANAGE	Nov/Dec-20) R TECHNOLC METN	19 DGY	
Day a Time	& Da : 02	ate: Thursday, 19- :30 PM To 04:30 F	2-2019 M		Ν	Max. Marks	s: 40
Instr	ucti	ons: 1) All questic 2) Figure to t	ns are compulso ne right indicates	ry. full marks.			
Q.2	Att a) b) c)	empt following q What is intellectu Explain concept Compare the Ind	Jestions (Any T al property? How of valuation of IP an IPR system v	wo) i it is useful for Er & value Realizati <i>i</i> ith international I	ngineers? ion. IPR frameworks		20
Q.3	Wr a) b) c) d) e)	ite short notes (A Copy rights Commercialization Bio technology a Protection of Tra IPR & Electronic	n n nd intellectual pro ditional knowledg Commerce	operty e			20

f) TRIPS & Access to Medicines

SLR-FM-642

					SLR-FM-64	42	
Sea No.	t				Set	Q	
	I	T.E. (Part – I) ((S NTELLECTUAL DEVEL	DId) (CBCS) Ex Self Learning (<i>/</i> PROPERTY RI .OPMENT AND	ami All B GH1 MA	nation Nov/Dec-2019 Branch) IS FOR TECHNOLOGY NAGEMETN		
Day Time	& Dat : 02:3	e: Thursday, 19-12-2 0 PM To 04:30 PM	2019		Max. Marks:	50	
Instr	 Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book. 2) Figures al right indicate full marks. 						
		М	CQ/Objective Ty	pe Q	uestions		
Dura	tion: 2	20 Minutes			Marks:	10	
Q.1	Cho 1)	ose the correct alte The following can b a) Machine c) Composition o	ernatives from the e patented f matter	e opt b) d)	i ons. Process All of these	10	
	2)	The following can n others a) Patents c) Trademark	ot be exploited by	assi b) d)	gning or by licensing the rights to Designs All of these		
	3)	What protects the ir a) Copyright c) Trademarks	ntellectual property	y crea b) d)	ated by artists? Patents Registered Designs		
	 4) If a company develops a new technology that improves its main product, what type of intellectual property can they use to stop others from copying their invention? a) Copyright b) Patents c) Tradomarks d) Pogistored Designs 						
	5)	All of the following a a) Copyrights c) Contracts	are examples of in	tellec b) d)	ctual property protections except Patents Trademarks	·	
	6)	The first Patent Lav a) 1856 c) 1905	v was enacted in I	ndia b) d)	in the year 1880 1850		
	7)	The legislation cover Technology is a) Information Technology is b) Information Technology (c) Information Information Information Information Information Information Info	ering intellectual p chnology Act 2003 chnology Act 2000 chnology Act 2008	roper 3) 3	ty right in India for Information		
	8)	What is copyright m a) Film work c) Essay	neant for?	b) d)	Books All of these		

- 9) What is the term of Patent?
 - a) 35 years c) 20 years

b) 25 years

SLR-FM-642

Set Q

- 20 years d) 15 years
- 10) Intellectual Property Rights (IPR) protect the use of information and ideas that are of _____.
 - a) Ethical value
 - c) Social value

- b) Moral value
- d) Commercial value

Page 6 of 12

Seat Set No. T.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN Day & Date: Thursday, 19-12-2019 Max. Marks: 40 Time: 02:30 PM To 04:30 PM **Instructions:** 1) All questions are compulsory. 2) Figure to the right indicates full marks. Q.2 Attempt following questions (Any Two)

- a) What is intellectual property? How it is useful for Engineers?
- b) Explain concept of valuation of IP & value Realization.
- c) Compare the Indian IPR system with international IPR frameworks.

Q.3 Write short notes (Any Four)

- Copy rights a)
- b) Commercialization
- c) Bio technology and intellectual property
- d) Protection of Traditional knowledge
- e) IPR & Electronic Commerce
- f) **TRIPS & Access to Medicines**

SLR-FM-642

Q

20

SLR-FM-642 Set

Seat No.

T.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN

Day & Date: Thursday, 19-12-2019 Time: 02:30 PM To 04:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

2) Figures al right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes

6)

Q.1 Choose the correct alternatives from the options.

- If a company develops a new technology that improves its main product, 1) what type of intellectual property can they use to stop others from copying their invention?
 - Copyright a)
 - Trademarks c) **Registered Designs** d)

2) All of the following are examples of intellectual property protections except .

b)

Patents

- Copyrights Patents a) b) c) Contracts d) Trademarks
- The first Patent Law was enacted in India in the year _____. 3)
 - 1856 1880 a) b)
 - C) 1905 d) 1850
- The legislation covering intellectual property right in India for Information 4) Technology is _
 - Information Technology Act 2003 a)
 - Information Technology Act 2000 b)
 - Information Technology Act 2008 c)
 - None of these d)
- What is copyright meant for? 5)
 - Film work Books a) b) c) Essay d) All of these
 - What is the term of Patent?
 - 35 years a) b) 25 years 15 years 20 years d) C)
- Intellectual Property Rights (IPR) protect the use of information and ideas 7) that are of
 - a) Ethical value b) Moral value c)
 - Social value d) Commercial value
- 8) The following can be patented _____
 - Machine b) Process a)
 - C) Composition of matter d) All of these

Marks: 10

Max. Marks: 50

9) The following can not be exploited by assigning or by licensing the rights to others __ _.

a) Patents

10)

- b) Designs All of these
- C) Trademark d)
- What protects the intellectual property created by artists?
- a) Copyright
 - Trademarks

b) Patents

C)

Registered Designs d)

SLR-FM-642

Set R

Set R

T.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN

Day & Date: Thursday, 19-12-2019 Max. Marks: 40 Time: 02:30 PM To 04:30 PM **Instructions:** 1) All questions are compulsory. 2) Figure to the right indicates full marks. Q.2 Attempt following questions (Any Two) 20 a) What is intellectual property? How it is useful for Engineers? b) Explain concept of valuation of IP & value Realization. c) Compare the Indian IPR system with international IPR frameworks. Q.3 Write short notes (Any Four) 20 Copy rights a) b) Commercialization c) Bio technology and intellectual property d) Protection of Traditional knowledge e) IPR & Electronic Commerce

f) TRIPS & Access to Medicines

	SLR-FM-642							
Seat No.	t				Set	S		
T.E. (Part – I) (Old) (CBCS) Examination Nov/Dec-2019 Self Learning (All Branch) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMETN								
Day & Time	Day & Date: Thursday, 19-12-2019 Max. Marks: 50 Time: 02:30 PM To 04:30 PM Max. Marks: 50							
Instr	Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.2) Figures al right indicate full marks.							
		МС	CQ/Objective Type	e Qı	uestions			
Durat	tion: 2	20 Minutes			Marks:	10		
Q.1	Cho	ose the correct alter	rnatives from the o	opti	ions.	10		
	1)	a) Film work c) Essay	eant for? b d)	Books All of these			
	2)	What is the term of F a) 35 years c) 20 years	Patent? b d))	25 years 15 years			
	3)	Intellectual Property that are of a) Ethical value c) Social value	Rights (IPR) protect	ot th	ne use of information and ideas Moral value Commercial value			
	4)	The following can be a) Machine c) Composition of	e patented b matter d)	Process All of these			
	5)	The following can no others a) Patents c) Trademark	ot be exploited by a b d	ssig))	gning or by licensing the rights to Designs All of these			
	6)	What protects the int a) Copyright c) Trademarks	tellectual property c b d	crea))	ated by artists? Patents Registered Designs			
	7)	If a company develo what type of intellect their invention? a) Copyright c) Trademarks	ps a new technolog tual property can th b d	gytł eyt)	nat improves its main product, use to stop others from copying Patents Registered Designs			
	8)	All of the following an all of the following an all all all all all all all all all	re examples of inte b d	llec))	tual property protections except Patents Trademarks			
	9)	The first Patent Law a) 1856 c) 1905	was enacted in Ind b d	lia i))	n the year 1880 1850			

10) The legislation covering intellectual property right in India for Information Technology is _ Technology is _____. a) Information Technology Act 2003 b) Information Technology Act 2000

- Information Technology Act 2008 c)
- d) None of these

SLR-FM-642

Set S

Seat No.	t					Set	S
		T.E. (Part – I INTELLECTUA DEV	(Old) (CBCS) Self Learnin L PROPERT ELOPMENT) Examination ng (All Branch) Y RIGHTS FOR AND MANAGE	Nov/Dec-2019 TECHNOLOC METN) SY	
Day a Time	& Da : 02	ate: Thursday, 19-′ :30 PM To 04:30 P	2-2019 M		Ma	ix. Marks	s: 40
Instr	ucti	ons: 1) All questio 2) Figure to t	ns are compulsone right indicates	ry. s full marks.			
Q.2	Att a) b) c)	empt following q What is intellectu Explain concept o Compare the Ind	Jestions (Any T al property? How of valuation of IP an IPR system v	wo) / it is useful for En & value Realizatio /ith international II	gineers? on. ^o R frameworks.		20
Q.3	Wr a) b) c) d) e)	ite short notes (A Copy rights Commercialization Bio technology and Protection of Trace IPR & Electronic	n y Four) n nd intellectual pr ditional knowledg Commerce	operty je			20

f) TRIPS & Access to Medicines

SLR-FM-642

SLR-FM-65

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume the suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Dura	tion: 3	30 Minutes Marks	: 14				
Q.1	Cho 1)	 ose the correct alternatives from the options and rewrite the sentence. In which of the following cases, the dynamic system has no oscillation but returns to equilibrium at a slower rate? a) Critically damped case b) Over-damped case c) Under-damped case d) None of above 	14 02				
	2)	C) Onder damped cased) None of aboveThe damping in a dynamic system is represented as equivalent toa) Coulomb dampingb) Viscous dampingc) Friction dampingd) Negative damping	02				
	3)	The response steadily decreases when the frequency ratio isa) <1	02				
	4)	 Most rigid element in the structure will receive a) Least of the lateral load due to seismic action b) Most of the lateral load due to seismic action c) The same lateral load as that of any element, due to seismic action d) None of above 					
	5)	 Moment-resistant rigid joints in the structure will a) Increase the ductility of the structure b) Decrease the ductility of the structure c) Not affect the ductility of the structure d) None of above 	02				
	6)	 In the moment-resistant rigid framing system, for better seismic resistance, it is preferable to have a) The moment capacity of column greater than that of the beam at the joint b) The moment capacity of beam greater than that of the column at the joint 	02				
		 c) The moment capacity of beam equal to that of the column at the joint d) None of above 					

Max. Marks: 70

Set Ρ

Seat No.

- The following is not a brittle failure of an RCC structure _____. 7)

 - a) Shear failureb) Yielding of reinforcement in tension
 - c) Bond failure
 - d) Crushing of concrete in compression
- Ductility in the structure _____. 8)
 - a) Increases the damping
 - c) Decreases the seismic force
- b) Increases the deformation
 - d) All the above

01

SLR-FM-65

Set P

No.	

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM Max. Marks: 56

Instructions: 1) Q.No.4 and Q.No.6 are compulsory.

- 2) Solve any two questions from the remaining question from each section.
- 3) Assume the suitable data whenever necessary.
- 4) Figures to the right indicate full marks.
- 5) Use of only IS 1893:2016 is allowed.

Section – I

- Q.2 What is meant by the focus and epicentre of an earthquake? Name the two kinds of body waves and explain how they differ.
- Q.3 A rod made of an elastic material with modulus of elasticity *E*. having cross-sectional area and length *L* is fixed on top. carrying a mass *m* at its lower end. Derive the equation governing longitudinal motion of the system ignore mass of the rod and measure displacement, *x* from the static equilibrium position.



- Q.4 What do you mean by force transmissibility? Derive an expression for force 10 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- **Q.5** What is combined spectrum? What are its characteristics?

09

SLR-FM-65 Set P

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. Of walls is 230mm. The ht. Of floor is 3.2m & Live load is 4.0 kN/m² IS 13920 provisions will not be used. The strata is Medium.



- **Q.7** Discuss the factors required for accessing
 - a) The lateral design forces
 - b) The design response spectrum
- Q.8 State the reasons for the poor performances of masonry buildings in seismic 09 areas.
- Q.9 Describe the various earthquake resistant features that can be introduced in masonry building to make it earthquake resistant.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM

Max. Marks: 70

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Assume the suitable data whenever necessary.

- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Dura	tion: 3	0 Minutes Marks:	14				
Q.1	Choo 1)	 bese the correct alternatives from the options and rewrite the sentence. Moment-resistant rigid joints in the structure will a) Increase the ductility of the structure b) Decrease the ductility of the structure c) Not affect the ductility of the structure d) None of above 	14 02				
	2)	 In the moment-resistant rigid framing system, for better seismic resistance, it is preferable to have a) The moment capacity of column greater than that of the beam at the joint b) The moment capacity of beam greater than that of the column at the joint c) The moment capacity of beam equal to that of the column at the joint d) None of above 	02				
	3)	 The following is not a brittle failure of an RCC structure a) Shear failure b) Yielding of reinforcement in tension c) Bond failure d) Crushing of concrete in compression 					
	4)	Ductility in the structurea) Increases the dampingb) Increases the deformationc) Decreases the seismic forced) All the above	01				
	5)	In which of the following cases, the dynamic system has no oscillation but returns to equilibrium at a slower rate? a) Critically damped case b) Over-damped case c) Under-damped case d) None of above	02				
	6)	The damping in a dynamic system is represented as equivalent toa) Coulomb dampingb) Viscous dampingc) Friction dampingd) Negative damping	02				
	7)	The response steadily decreases when the frequency ratio is a) <1 b) >1 c) =1 d) =V2	02				

Seat No.





- Most rigid element in the structure will receive _____a) Least of the lateral load due to seismic action 8) ____-·

 - b) Most of the lateral load due to seismic action
 - c) The same lateral load as that of any element, due to seismic action
 - d) None of above

Seat	
No.	



B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM Max. Marks: 56

Instructions: 1) Q.No.4 and Q.No.6 are compulsory.

- 2) Solve any two questions from the remaining question from each section.
- 3) Assume the suitable data whenever necessary.
- 4) Figures to the right indicate full marks.
- 5) Use of only IS 1893:2016 is allowed.

Section – I

- Q.2 What is meant by the focus and epicentre of an earthquake? Name the two kinds of body waves and explain how they differ.
- Q.3 A rod made of an elastic material with modulus of elasticity *E*. having cross-sectional area and length *L* is fixed on top. carrying a mass *m* at its lower end. Derive the equation governing longitudinal motion of the system ignore mass of the rod and measure displacement, *x* from the static equilibrium position.



- Q.4 What do you mean by force transmissibility? Derive an expression for force 10 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- Q.5 What is combined spectrum? What are its characteristics?

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. Of walls is 230mm. The ht. Of floor is 3.2m & Live load is 4.0 kN/m² IS 13920 provisions will not be used. The strata is Medium.



- **Q.7** Discuss the factors required for accessing
 - a) The lateral design forces
 - b) The design response spectrum
- **Q.8** State the reasons for the poor performances of masonry buildings in seismic **09** areas.
- Q.9 Describe the various earthquake resistant features that can be introduced in masonry building to make it earthquake resistant.

Set

R

Seat	
No.	

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM

Duration: 30 Minutes

Max. Marks: 70

Marks: 14

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.2) Assume the suitable data whenever necessary.

3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Q.1	Choo 1)	Descriptions and rewrite the sentence.The response steadily decreases when the frequency ratio isa) <1b) >1c) =1d) =V2	14 02			
	2)	 Most rigid element in the structure will receive a) Least of the lateral load due to seismic action b) Most of the lateral load due to seismic action c) The same lateral load as that of any element, due to seismic action d) None of above 	02			
	3)	 Moment-resistant rigid joints in the structure will a) Increase the ductility of the structure b) Decrease the ductility of the structure c) Not affect the ductility of the structure d) None of above 	02			
	4)	 In the moment-resistant rigid framing system, for better seismic resistance, it is preferable to have a) The moment capacity of column greater than that of the beam at the joint b) The moment capacity of beam greater than that of the column at the joint c) The moment capacity of beam equal to that of the column at the joint d) None of above 				
	5)	 The following is not a brittle failure of an RCC structure a) Shear failure b) Yielding of reinforcement in tension c) Bond failure d) Crushing of concrete in compression 	01			
	6)	Ductility in the structurea) Increases the dampingb) Increases the deformationc) Decreases the seismic forced) All the above	01			
	7)	In which of the following cases, the dynamic system has no oscillation but returns to equilibrium at a slower rate? a) Critically damped case b) Over-damped case c) Under-damped case d) None of above	02			



- The damping in a dynamic system is represented as equivalent to _____.a) Coulomb dampingb) Viscous damping 8)

 - c) Friction damping

- Negative damping d)

R

DE	/Dort	I)	
B.E.	(Part	- 1)	(New)

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM

Seat

No.

Max. Marks: 56

Instructions: 1) Q.No.4 and Q.No.6 are compulsory.

- 2) Solve any two questions from the remaining question from each section.
- 3) Assume the suitable data whenever necessary.
- 4) Figures to the right indicate full marks.
- 5) Use of only IS 1893:2016 is allowed.

Section – I

- Q.2 What is meant by the focus and epicentre of an earthquake? Name the two kinds of body waves and explain how they differ.
- Q.3 A rod made of an elastic material with modulus of elasticity *E*. having cross-sectional area and length *L* is fixed on top. carrying a mass *m* at its lower end. Derive the equation governing longitudinal motion of the system ignore mass of the rod and measure displacement, *x* from the static equilibrium position.



- Q.4 What do you mean by force transmissibility? Derive an expression for force 10 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- Q.5 What is combined spectrum? What are its characteristics?

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. Of walls is 230mm. The ht. Of floor is 3.2m & Live load is 4.0 kN/m² IS 13920 provisions will not be used. The strata is Medium.



- **Q.7** Discuss the factors required for accessing
 - a) The lateral design forces
 - b) The design response spectrum
- Q.8 State the reasons for the poor performances of masonry buildings in seismic 09 areas.
- Q.9 Describe the various earthquake resistant features that can be introduced in masonry building to make it earthquake resistant.
SLR-FM-65

Seat	
No.	

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Assume the suitable data whenever necessary. 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes - 41

Q.1	Choo 1)	 be the correct alternatives from the options and rewrite the sentence. The following is not a brittle failure of an RCC structure a) Shear failure b) Yielding of reinforcement in tension c) Bond failure d) Crushing of concrete in compression 	14 01
	2)	Ductility in the structurea) Increases the dampingb) Increases the deformationc) Decreases the seismic forced) All the above	01
	3)	In which of the following cases, the dynamic system has no oscillation but returns to equilibrium at a slower rate? a) Critically damped case b) Over-damped case c) Under-damped case d) None of above	02
	4)	The damping in a dynamic system is represented as equivalent toa) Coulomb dampingb) Viscous dampingc) Friction dampingd) Negative damping	02
	5)	The response steadily decreases when the frequency ratio is a) <1 b) >1 c) =1 d) = $V2$	02
	6)	 Most rigid element in the structure will receive a) Least of the lateral load due to seismic action b) Most of the lateral load due to seismic action c) The same lateral load as that of any element, due to seismic action d) None of above 	02
	7)	 Moment-resistant rigid joints in the structure will a) Increase the ductility of the structure b) Decrease the ductility of the structure 	02

- c) Not affect the ductility of the structure
- d) None of above

Max. Marks: 70

Marks: 14

Set S

SLR-FM-65



8) In the moment-resistant rigid framing system, for better seismic resistance, it is preferable to have _____.

- a) The moment capacity of column greater than that of the beam at the joint
- b) The moment capacity of beam greater than that of the column at the joint
- c) The moment capacity of beam equal to that of the column at the joint
- d) None of above

Seat No.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.4 and Q.No.6 are compulsory.

- 2) Solve any two questions from the remaining question from each section.
- 3) Assume the suitable data whenever necessary.
- 4) Figures to the right indicate full marks.
- 5) Use of only IS 1893:2016 is allowed.

Section – I

- Q.2 What is meant by the focus and epicentre of an earthquake? Name the two kinds of body waves and explain how they differ.
- Q.3 A rod made of an elastic material with modulus of elasticity *E*. having cross-sectional area and length *L* is fixed on top. carrying a mass *m* at its lower end. Derive the equation governing longitudinal motion of the system ignore mass of the rod and measure displacement, *x* from the static equilibrium position.

- Q.4 What do you mean by force transmissibility? Derive an expression for force 10 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- Q.5 What is combined spectrum? What are its characteristics?

09





Max. Marks: 56



SLR-FM-65

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. Of walls is 230mm. The ht. Of floor is 3.2m & Live load is 4.0 kN/m² IS 13920 provisions will not be used. The strata is Medium.



- **Q.7** Discuss the factors required for accessing
 - a) The lateral design forces
 - b) The design response spectrum
- **Q.8** State the reasons for the poor performances of masonry buildings in seismic **09** areas.
- Q.9 Describe the various earthquake resistant features that can be introduced in masonry building to make it earthquake resistant.

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering ENGINEERING MANAGEMENT- II**

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- Which of the following tools is/are used when there is uncertainty in 1) activity durations?
 - Bar Chart a)

- **CPM** network b)
- C) PERT network d) All of these
- 2) Arrange the following steps of project scheduling in correct order
 - Develop the schedule i)
 - Define the activities ii)
 - iii) Determine the logical dependency between the activities
 - Calculate the time required for each activity iv)
 - Estimate the resources required for each activity V)
 - i),ii),iii),iv),v) ii),iii),v),iv),i) a) b)
 - iii),iv),v),i),ii) d) v),iv),iii),ii),i) c)
- 3) Read the following statements.
 - A WBS need not be hierarchical in nature. i)
 - A WBS is a framework for converting project objectives to specific ii) deliverables.
 - iii) A WBS need not be comprehensive, there can be gaps in job logic.
 - A WBS should have a level of detail required to plan, communicate, iv) monitor and control the project.

Choose the correct option from the following:

- a) i.ii b) ii.iii d) all of these ii.iv C)
- 4) Please read the following statements:
 - Critical path has no float and it determines the project completion i) period
 - Critical path is the largest path which actually is the shortest duration ii) within which the project can be completed
 - Which of the above statements are wrong?
 - b) a) i) ii) Both i) and ii) Neither i) nor ii) d) C)
- 5) PERT in Project Management is a tool for managing _____.
 - Time Cost a) b)
 - C) Quality d) Resources

Max. Marks: 70

SLR-FM-66

Set

Marks: 14

				SLR-FM	-66		
				Set	Ρ		
6)	Bas i) ii) iii) a)	ed on the following statements of There can be only one critical It is necessary to introduce a c ensure logic The critical path is the longest i	select path i lumm path i b)	the correct option: n a project network y activity in AON network to in the network ii			
	c)	iii	d)	i and ii			
7)	The a) c)	e critical path activities have negative zero	floa b) d)	at. non zero positive			
8)	Floa a) c)	at is used for Activities Nodes	b) d)	Events None of the above			
9)	any a) c)	is the maximum delay possit delay in its precedence or succ Total float Continuous float	ole for eedin b) d)	an activity without considering g activity. Free float Independent float			
10)	 What is the correct sequence for floats? a) Independent float < Total float < Free float b) Total Float <= Free Float <= Independent Float c) Independent Float <= Free Float <= Total Float d) Free Float < Total Float < Independent Float 						
11)	The a) b) c) d)	 The early finish of an activity is always: a) greater than earliest start time of the following node b) less than earliest start time of the following node c) greater than or equal to earliest start time of the following node d) less than or equal to earliest start time of the following node 					
12)	Cho a)	oose the correct condition for cra Crash Direct cost > Normal Dir duration	ishing rect c	I ost, Crash time > Normal			
	 b) Crash Direct cost < Normal Direct cost, Crash time > Normal duration c) Crash Direct cost < Normal Direct cost, Crash time < Normal 						
	d)	duration Crash Direct cost > Normal Dir duration	rect co	ost, Crash time < Normal			
13)	 Below are statements with respect to resource leveling i) It involves shifting activities within their float to minimize fluctuations in daily resource use. 						
	 ii) One of the strategies of resource leveling include interrupting an activity and resuming it later. iii) Resource can be levelled by extending the deadline of the project and keeping the daily resource requirement within available limits Which of the above statement/s are false? 						
	a) c)	ii i, iii	b) d)	ii, iii None of the above			
4 4)	\ \/ L:	ich of the following is not a char		atio of a project?			

- 14) Which of the following is not a characteristic of a project? Unique . Infinite b) a)
 - Heterogeneous d) Non-repetitive c)
- Page **2** of **20**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

ENGINEERING MANAGEMENT- II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. 2 and Q.6 are compulsory. Answer any two questions out of remaining three questions from each section.

2) Figures to the right indicate full marks.

Section – I

Q.2 a) Draw the Bar Chart for the project with following data and find the project 04 duration.

Activity	Preceding	Duration
	Activities	(days)
A		2
В		4
С		10
D	В	3
E	A,B	5
F	В	6
G	В	4
Н	C,D	1
I	G,H	7

- b) Differentiate between Bar chart and Milestone chart.
- c) Explain the Fulkerson's rule.
- Q.3 a) In Table 1, activities and their uncertainty in duration captured in terms of optimistic, most likely and pessimistic duration (to, tm and tp respectively). Calculate the project duration.

Table 1							
Activity ID	IPA	to	t _m	tp			
А	-	10	12	16			
В	Α	6	9	12			
С	B,D	2	3	5			
D	-	8	10	14			
E	D	5	6	8			
F	E	2	3	4			
G	-	1	2	3			
Н	G	7	9	11			
J	E,H	1	2	3			



SLR-FM-66

Set

Seat No.

04

04

04

b) Calculate the project duration. What is the critical path of the project network?

Activity	Predecessor	Duration
А	Nil	2
В	A	4
С	A	3
D	B,C	6
E	B,C	9
F	D,E	3

Q.4 a) For the following project indirect cost- Rs. 800 Day.

Activity	Predecessor	Normal	Crash	Normal	Crash	
		Duration	Duration	Cost	Cost	
		(Days)	(Days)	(Rs)	(Rs)	
А	-	5	4	5000	7000	
В	-	3	3	4000	-	
С	A,B	3	1	3000	4500	
D	В	4	2	8000	10000	
E	C,D	5	3	4000	6000	
F	E	2	1	7000	7500	

Calculate

- a) The sequence of the activities in critical path.
- b) The slope of activity D.
- c) The direct cost of project if the duration is reduced to 13 days.
- d) The indirect cost of project if the duration is reduced to 14 days.
- e) The total cost of project if the duration is reduced to 14 days.
- f) Minimum total cost and optimal duration.

b) Prepare a network from following data. Answer the questions.

Activity	Predecessor	Duration	Resource rate/day
A	-	8	4
В	-	2	7
С	В	4	3
D	С	3	3
E	D	5	6
F	В	6	5

- 1) What is Critical path and duration
- 2) What is free flat of activities A and F
- 3) If all the activities started on early start (ES), when shall be the minimum daily resource requirement?
- 4) If all activities are started on early start (ES), what shall be the cumulative daily resource requirement on days 3, 6, 9, 12?
- 5) If only 11 units are available on a daily basis. On which days resources are over allocated if all activities start on early start (ES)?

Q.5 Explain

- a) The reports possible to be generated by a project management software.
- b) Information system planning design and implementation.

04

Set P

SLR-FM-66

04

SLR-FM-66 Set P

Section - II

- Q.6 a) Project-A cost INR 100 crore to construct and an annual return of INR 40 04 crore is expected for next 5 years. On the other hand, project B costs INR 150 crore to construct and the expected annual return is INR 20 crore for next 15 years. Assume that the applicable rate of interest is 10%. Which project should be preferred by the owner based on their NPV? Consider an equipment with an initial value of INR 50 lakhs (INR 5 04 b) million). It has been estimated that at the end of the service life of 5 years, the salvage value of the equipment is INR 5 lakhs. Assuming that the 'sum of years' method is used for calculating depreciation, what is the book value of the equipment after 3 years of operation? Explain the different types of interest 04 C) Q.7 Write a note on "Precedence Network" and its relation-ships presentation 80 a)
- **Q.7** a) Write a note on "Precedence Network" and its relation-ships presentation **Us** with sketch.
 - **b)** When to apply Value Engineering? What are the application areas of value engineering?
- Q.8 a) There are two alternatives for purchasing a concrete mixer. Both the alternatives have same useful life. The cash flow details of alternatives are as follows:

Alternative- 1: Initial purchase cost = Rs.3,00,000, Annual operating and maintenance cost = Rs.20,000, Expected salvage value = Rs.1,25,000, Useful life = 5 years.

Alternative- 2: Initial purchase cost = Rs.2,00,000, Annual operating and maintenance cost = Rs.35,000, Expected salvage value = Rs.70,000, Useful life = 5 years.

Using present worth method, find out which alternative should be selected, if the rate of interest is 10% per year.

b) Define Life Cycle Costing. What are its purpose and implications?

Q.9 Compare

- a) Discounting methods and Nondiscounting methods.
- **b)** EUAC method and IRR method.

		B.E.	(Part – I) (New) (CBCS) E		Ination Nov/Dec-2019		
Day 8 Time	& Date : 02:30	: Sat PM	urday, 14-12-2019 To 05:30 PM		Max. Marks: 70		
Instr	uction	is: 1)	Q. No. 1 is compulsory and show Book.	uld be	e solved in first 30 minutes in answer		
		2)	Figures to the right indicate full	mark	S.		
			MCQ/Objective Ty	pe C	Questions		
Durat	ion: 3	0 Min	utes		Marks: 14		
Q.1	Choo	ose th	ne correct alternatives from the	e opti	ions. 14		
	1)	Floa	t is used for		E		
		a) c)	Nodes	b) d)	None of the above		
	2)		is the maximum delay possible	e for a	an activity without considering		
		any	delay in its precedence or succe	eding	j activity.		
		a)	Total float	b)	Free float		
	•	C)	Continuous float	d)	Independent float		
	3)	Wha	It is the correct sequence for float	ts?	, float		
		a) b)	Total Float <= Free Float <= Ind	epen	ident Float		
		c)	Independent Float <= Free Floa	t <= -	Total Float		
		d)	Free Float < Total Float < Indep	ende	nt Float		
	4)	The	early finish of an activity is alway	′s:	·		
		a)	greater than earliest start time of	f the	following node		
		D)	less than earliest start time of the	e foll	owing node		
		d)	less than or equal to earliest sta	rt tim	e of the following node		
	5)	Cho	ose the correct condition for cras	hina			
	0)	a)	Crash Direct cost > Normal Dire	ct co	st, Crash time > Normal		
		b)	Crash Direct cost < Normal Dire	ct co	st_Crash time > Normal		
		2)	duration	01 00			
		c)	Crash Direct cost < Normal Dire	ct co	st, Crash time < Normal		
		d)	Crash Direct cost > Normal Dire	ct co	st, Crash time < Normal		
		,	duration				
	6)	Belo	w are statements with respect to	reso	urce leveling		
		i)	It involves shifting activities with	in the	eir float to minimize fluctuations		
		::)	in daily resource use.		aling include interrupting on		
		II)	activity and resuming it later	eieve	ening include interrupting an		
		iii)	Resource can be levelled by exi	endir	ng the deadline of the project		
		,	and keeping the daily resource	requii	rement within available limits		
		Whic	ch of the above statement/s are f	alse?			
		a)	Ш	D)	11, 111		

SLR-FM-66

Seat

1) /6 aa 2010 -

No. /Dart

- a) c) b) d) i, iii None of the above

Set Q

- 7) Which of the following is not a characteristic of a project?
 - Unique a)

c)

- Heterogeneous
- Infinite d) Non-repetitive

SLR-FM-66

Set

8) Which of the following tools is/are used when there is uncertainty in activity durations?

b)

- a) Bar Chart b) CPM network
- PERT network d) All of these C)
- 9) Arrange the following steps of project scheduling in correct order
 - Develop the schedule i)
 - ii) Define the activities
 - iii) Determine the logical dependency between the activities
 - Calculate the time required for each activity iv)
 - Estimate the resources required for each activity v)
 - i),ii),iii),iv),v) b) ii),iii),v),iv),i) a)
 - (iii),iv),v),i),ii)d) c) v),iv),iii),ii),i)
- 10) Read the following statements.
 - A WBS need not be hierarchical in nature. i)
 - A WBS is a framework for converting project objectives to specific ii) deliverables.
 - A WBS need not be comprehensive, there can be gaps in job logic. iii)
 - A WBS should have a level of detail required to plan, communicate, iv) monitor and control the project.

Choose the correct option from the following:

- i,ii a) b) ii,iii
- C) ii,iv d) all of these
- 11) Please read the following statements:
 - Critical path has no float and it determines the project completion i) period
 - Critical path is the largest path which actually is the shortest duration ii) within which the project can be completed
 - Which of the above statements are wrong?
 - i) a)

a)

- b) ii)
- C) Both i) and ii) d) Neither i) nor ii)
- 12) PERT in Project Management is a tool for managing _____
 - Time a) b) Cost
 - Quality d) Resources C)
- 13) Based on the following statements select the correct option:
 - There can be only one critical path in a project network i)
 - ii) It is necessary to introduce a dummy activity in AON network to ensure logic
 - The critical path is the longest path in the network iii)
 - i b) ii
 - c) iii d) i and ii
- float. 14) The critical path activities have ____
 - negative b) non zero a) c)
 - d) positive zero

04

04

SLR-FM-66

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT- II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions: 1) Q. 2 and Q.6 are compulsory. Answer any two questions out of remaining three questions from each section.
 - 2) Figures to the right indicate full marks.

Section – I

Q.2 a) Draw the Bar Chart for the project with following data and find the project **04** duration.

Activity	Preceding	Duration
	Activities	(days)
A		2
В		4
С		10
D	В	3
E	A,B	5
F	В	6
G	В	4
Н	C,D	1
	G,H	7

- b) Differentiate between Bar chart and Milestone chart.
- **c)** Explain the Fulkerson's rule.
- Q.3 a) In Table 1, activities and their uncertainty in duration captured in terms of optimistic, most likely and pessimistic duration (to, tm and tp respectively). Calculate the project duration.

Table 1							
Activity ID	IPA	to	t _m	tp			
A	-	10	12	16			
В	А	6	9	12			
С	B,D	2	3	5			
D	-	8	10	14			
E	D	5	6	8			
F	ш	2	3	4			
G	-	1	2	3			
Н	G	7	9	11			
J	E,H	1	2	3			



04

04

Calculate the project duration. What is the critical path of the project b) network?

Activity	Predecessor	Duration
А	Nil	2
В	A	4
С	A	3
D	B,C	6
E	B,C	9
F	D,E	3

Q.4 a) For the following project indirect cost- Rs. 800 Day.

Activity	Predecessor	Normal	Crash	Normal	Crash
		Duration	Duration	Cost	Cost
		(Days)	(Days)	(Rs)	(Rs)
А	-	5	4	5000	7000
В	-	3	3	4000	-
С	A,B	3	1	3000	4500
D	В	4	2	8000	10000
E	C,D	5	3	4000	6000
F	E	2	1	7000	7500

Calculate

- The sequence of the activities in critical path. a)
- The slope of activity D. b)
- The direct cost of project if the duration is reduced to 13 days. c)
- The indirect cost of project if the duration is reduced to 14 days. d)
- The total cost of project if the duration is reduced to 14 days. e)
- Minimum total cost and optimal duration. f)

Prepare a network from following data. Answer the questions. b)

Activity	Predecessor	Duration	Resource rate/day
A	-	8	4
В	-	2	7
С	В	4	3
D	С	3	3
E	D	5	6
F	В	6	5

- What is Critical path and duration 1)
- What is free flat of activities A and F 2)
- If all the activities started on early start (ES), when shall be the 3) minimum daily resource requirement?
- If all activities are started on early start (ES), what shall be the 4) cumulative daily resource requirement on days 3, 6, 9, 12?
- 5) If only 11 units are available on a daily basis. On which days resources are over allocated if all activities start on early start (ES)?

Q.5 Explain

- The reports possible to be generated by a project management software. a)
- Information system planning design and implementation. b)

04

04

04

Set

SLR-FM-66

SLR-FM-66 Set Q

Section – II

Q.6 a) Project-A cost INR 100 crore to construct and an annual return of INR 40 04 crore is expected for next 5 years. On the other hand, project B costs INR 150 crore to construct and the expected annual return is INR 20 crore for next 15 years. Assume that the applicable rate of interest is 10%. Which project should be preferred by the owner based on their NPV? Consider an equipment with an initial value of INR 50 lakhs (INR 5 04 b) million). It has been estimated that at the end of the service life of 5 years, the salvage value of the equipment is INR 5 lakhs. Assuming that the 'sum of years' method is used for calculating depreciation, what is the book value of the equipment after 3 years of operation? Explain the different types of interest 04 C) Q.7 Write a note on "Precedence Network" and its relation-ships presentation 80 a) with sketch. When to apply Value Engineering? What are the application areas of b) value engineering? There are two alternatives for purchasing a concrete mixer. Both the **Q.8** a) 80 alternatives have same useful life. The cash flow details of alternatives are as follows: Alternative- 1: Initial purchase cost = Rs.3,00,000, Annual operating and maintenance cost = Rs.20,000, Expected salvage value = Rs.1,25,000, Useful life = 5 years. Alternative- 2: Initial purchase cost = Rs.2,00,000, Annual operating and maintenance cost = Rs.35,000, Expected salvage value = Rs.70,000, Useful life = 5 vears. Using present worth method, find out which alternative should be selected, if the rate of interest is 10% per year. Define Life Cycle Costing. What are its purpose and implications? b)

Q.9 Compare

- a) Discounting methods and Nondiscounting methods.
- **b)** EUAC method and IRR method.

				Civil Enginoo	ri	na	•
			ENGINE	FRING MANA		H9 FMFNT- II	
Day	& Date	e: Sat	turday, 14-12-2019			Ma	ax. Marks: 70
Time	: 02:30	D PM	To 05:30 PM				
Instr	uctior	is: 1)) Q. No. 1 is compul	sory and should	b	e solved in first 30 minute	es in answer
		2) Figures to the right	t indicate full ma	rk	S.	
				niective Type	C	Juestions	
Dura	tion: 3	0 Mir	nutes			Rucotions	Marks: 14
Q.1	Choo	ose t	he correct alternat	ives from the o	pt	ions.	14
	1)	PEF	RT in Project Manag	ement is a tool f	or	managing	
		a)	Time	b)		Cost	
		c)	Quality	d)		Resources	
	2)	Bas	ed on the following	statements selec	ct	the correct option:	. .
		I) ;;)	I here can be only	one critical path	ir س	a project network	to
		11)	ensure logic		пy	activity in AON network	10
		iii)	The critical path is	the longest path	n ir	n the network	
		a)	i	b)		ii	
		c)	iii	d)		i and ii	
	3)	The	critical path activitie	es have flo	08	at.	
		a)	negative	b) d)		non zero	
	4)			u)		positive	
	4)	F108	At IS USED for	b)		Events	
		c)	Nodes	d)		None of the above	
	5)	,	is the maximum	, delav possible fo	or	an activity without consid	erina
	-,	any	delay in its precede	nce or succeedi	ng	j activity.	5
		a)	Total float	b)		Free float	
		c)	Continuous float	d)		Independent float	
	6)	Wha	at is the correct sequ	uence for floats?)		
		a)	Independent float	< Total float < Fr	.ee	e float	
		(D)	I Otal Float <= Free Independent Float	Float <= Independent <= Float <=	er	ident Float Total Float	
		d)	Free Float < Total	Float < Independ	_ de	ent Float	
	7)	The	early finish of an ac	tivitv is alwavs:			
	,	a)	greater than earlies	st start time of th	ne	following node	
		b)	less than earliest s	tart time of the f	oll	lowing node	
		C)	greater than or equ	ual to earliest sta	art	time of the following nod	e

d)

SLR-FM-66

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019

- less than or equal to earliest start time of the following node

Set R

SLR-FM-66 Set

- 8) Choose the correct condition for crashing
 - Crash Direct cost > Normal Direct cost, Crash time > Normal duration a)
 - b) Crash Direct cost < Normal Direct cost, Crash time > Normal duration
 - Crash Direct cost < Normal Direct cost, Crash time < Normal duration C)
 - Crash Direct cost > Normal Direct cost, Crash time < Normal duration d)
- 9) Below are statements with respect to resource leveling
 - It involves shifting activities within their float to minimize fluctuations i) in daily resource use.
 - ii) One of the strategies of resource leveling include interrupting an activity and resuming it later.
 - Resource can be levelled by extending the deadline of the project iii) and keeping the daily resource requirement within available limits
 - Which of the above statement/s are false? ii
 - ii. iii a) b) i, iii c)
 - d) None of the above
- Which of the following is not a characteristic of a project? 10)
 - Unique Infinite b) a)
 - Heterogeneous d) Non-repetitive c)
- Which of the following tools is/are used when there is uncertainty in 11) activity durations?
 - a) Bar Chart

- b) CPM network
- PERT network All of these c) d)
- Arrange the following steps of project scheduling in correct order 12)
 - i) Develop the schedule
 - Define the activities ii)
 - Determine the logical dependency between the activities iii)
 - Calculate the time required for each activity iv)
 - Estimate the resources required for each activity V)
 - i),ii),iii),iv),v) b) (ii),(iii),v),(iv),i)a)
 - iii),iv),v),i),ii) d) v),iv),iii),ii),i) c)
- 13) Read the following statements.
 - A WBS need not be hierarchical in nature. i)
 - A WBS is a framework for converting project objectives to specific ii) deliverables.
 - A WBS need not be comprehensive, there can be gaps in job logic. iii)
 - A WBS should have a level of detail required to plan, communicate, iv) monitor and control the project.

Choose the correct option from the following:

- a) i,ii b) ii.iii
- all of these c) ii,iv d)
- 14) Please read the following statements:
 - Critical path has no float and it determines the project completion period i)
 - ii) Critical path is the largest path which actually is the shortest duration within which the project can be completed

Which of the above statements are wrong?

b) a) i) ii) Both i) and ii) d) Neither i) nor ii) c)

Seat <u>No.</u> B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. 2 and Q.6 are compulsory. Answer any two questions out of remaining three questions from each section.

ENGINEERING MANAGEMENT- II

2) Figures to the right indicate full marks.

Section – I

Q.2 a) Draw the Bar Chart for the project with following data and find the project 04 duration.

Activity	Preceding	Duration	
	Activities	(days)	
A		2	
В		4	
С		10	
D	В	3	
E	A,B	5	
F	В	6	
G	В	4	
Н	C,D	1	
I	G,H	7	

- b) Differentiate between Bar chart and Milestone chart.
- c) Explain the Fulkerson's rule.
- Q.3 a) In Table 1, activities and their uncertainty in duration captured in terms of optimistic, most likely and pessimistic duration (to, tm and tp respectively). Calculate the project duration.

Table 1 Activity ID IPA to t_m tp А 10 12 16 -В A 12 6 9 С 2 3 B,D 5 14 D 8 10 _ Е 5 8 D 6 F 2 3 Е 4 3 G -1 2 Н G 7 11 9 2 E.H 3 J 1

)19

SLR-FM-66

Max. Marks: 56

04



04

04

Calculate the project duration. What is the critical path of the project b) network?

Activity	Predecessor	Duration
А	Nil	2
В	A	4
С	A	3
D	B,C	6
E	B,C	9
F	D,E	3

Q.4 a) For the following project indirect cost- Rs. 800 Day.

	3		· · · · · · · · · · · · · · · · · · ·		
Activity	Predecessor	Normal	Crash	Normal	Crash
		Duration	Duration	Cost	Cost
		(Days)	(Days)	(Rs)	(Rs)
А	-	5	4	5000	7000
В	-	3	3	4000	-
С	A,B	3	1	3000	4500
D	В	4	2	8000	10000
E	C,D	5	3	4000	6000
F	E	2	1	7000	7500

Calculate

- The sequence of the activities in critical path. a)
- The slope of activity D. b)
- The direct cost of project if the duration is reduced to 13 days. c)
- The indirect cost of project if the duration is reduced to 14 days. d)
- The total cost of project if the duration is reduced to 14 days. e)
- Minimum total cost and optimal duration. f)

Prepare a network from following data. Answer the questions. b)

Activity	Predecessor	Duration	Resource rate/day
A	-	8	4
В	-	2	7
С	В	4	3
D	С	3	3
E	D	5	6
F	В	6	5

- What is Critical path and duration 1)
- What is free flat of activities A and F 2)
- If all the activities started on early start (ES), when shall be the 3) minimum daily resource requirement?
- 4) If all activities are started on early start (ES), what shall be the cumulative daily resource requirement on days 3, 6, 9, 12?
- 5) If only 11 units are available on a daily basis. On which days resources are over allocated if all activities start on early start (ES)?

Q.5 Explain

- The reports possible to be generated by a project management software. a)
- Information system planning design and implementation. b)

04

04

04

Set

SLR-FM-66

SLR-FM-66 Set R

Section – II

Q.6	a)	Project-A cost INR 100 crore to construct and an annual return of INR 40 crore is expected for next 5 years. On the other hand, project B costs INR 150 crore to construct and the expected annual return is INR 20 crore for next 15 years. Assume that the applicable rate of interest is 10%. Which project should be preferred by the owner based on their NPV?	04
	b) c)	Consider an equipment with an initial value of INR 50 lakhs (INR 5 million). It has been estimated that at the end of the service life of 5 years, the salvage value of the equipment is INR 5 lakhs. Assuming that the 'sum of years' method is used for calculating depreciation, what is the book value of the equipment after 3 years of operation? Explain the different types of interest	04
Q.7	a)	Write a note on "Precedence Network" and its relation-ships presentation with skotch	08
	b)	When to apply Value Engineering? What are the application areas of value engineering?	
Q.8	a) b)	There are two alternatives for purchasing a concrete mixer. Both the alternatives have same useful life. The cash flow details of alternatives are as follows: Alternative- 1: Initial purchase cost = Rs.3,00,000, Annual operating and maintenance cost = Rs.20,000, Expected salvage value = Rs.1,25,000, Useful life = 5 years. Alternative- 2: Initial purchase cost = Rs.2,00,000, Annual operating and maintenance cost = Rs.35,000, Expected salvage value = Rs.70,000, Useful life = 5 years. Using present worth method, find out which alternative should be selected, if the rate of interest is 10% per year. Define Life Cycle Costing. What are its purpose and implications?	08
Q.9	Con	ipare	08

- a) Discounting methods and Nondiscounting methods.b) EUAC method and IRR method.

SLR-FM-66

Seat	
No.	

Duration: 30 Minutes

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENGINEERING MANAGEMENT- II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

- 1) What is the correct sequence for floats?
 - a) Independent float < Total float < Free float
 - b) Total Float <= Free Float <= Independent Float
 - c) Independent Float <= Free Float <= Total Float
 - d) Free Float < Total Float < Independent Float
- 2) The early finish of an activity is always: ____
 - a) greater than earliest start time of the following node
 - b) less than earliest start time of the following node
 - c) greater than or equal to earliest start time of the following node
 - d) less than or equal to earliest start time of the following node
- 3) Choose the correct condition for crashing _____
 - a) Crash Direct cost > Normal Direct cost, Crash time > Normal duration
 - b) Crash Direct cost < Normal Direct cost, Crash time > Normal duration
 - c) Crash Direct cost < Normal Direct cost, Crash time < Normal duration
 - d) Crash Direct cost > Normal Direct cost, Crash time < Normal duration
- 4) Below are statements with respect to resource leveling
 - i) It involves shifting activities within their float to minimize fluctuations in daily resource use.
 - ii) One of the strategies of resource leveling include interrupting an activity and resuming it later.
 - iii) Resource can be levelled by extending the deadline of the project and keeping the daily resource requirement within available limits Which of the above statement/s are false?
 - a) ii b) ii, iii
 - c) i, iii d) None of the above
- 5) Which of the following is not a characteristic of a project?
 - a) Unique

C)

- b) Infinite
- Heterogeneous d) Non-repetitive

Set

Max. Marks: 70

Marks: 14

- 6) Which of the following tools is/are used when there is uncertainty in activity durations?
 - a) Bar Chart

b) CPM network SLR-FM-66

Set S

PERT network C)

d) All of these

- 7) Arrange the following steps of project scheduling in correct order
 - Develop the schedule i)
 - Define the activities ii)
 - Determine the logical dependency between the activities iii)
 - iv) Calculate the time required for each activity
 - Estimate the resources required for each activity v)
 - a) i),ii),iii),iv),v) b) ii),iii),v),iv),i)
 - (iii),iv),v),i),ii)d) v),iv),iii),ii),ii),ii) c)
- 8) Read the following statements.
 - A WBS need not be hierarchical in nature. i)
 - ii) A WBS is a framework for converting project objectives to specific deliverables.
 - A WBS need not be comprehensive, there can be gaps in job logic. iii)
 - iv) A WBS should have a level of detail required to plan, communicate, monitor and control the project.

Choose the correct option from the following:

- a) i,ii b) ii.iii
- all of these ii,iv d) c)
- 9) Please read the following statements:
 - Critical path has no float and it determines the project completion i) period
 - Critical path is the largest path which actually is the shortest duration ii) within which the project can be completed

Which of the above statements are wrong?

- a) i) b) ii) Both i) and ii) d) C)
 - Neither i) nor ii)
- 10) PERT in Project Management is a tool for managing _____
 - Time Cost a) b)
 - C) Quality d) Resources
- Based on the following statements select the correct option: 11)
 - There can be only one critical path in a project network i)
 - ii) It is necessary to introduce a dummy activity in AON network to ensure logic
 - The critical path is the longest path in the network iii)
 - a) i b) ii
 - iii d) i and ii C)
- 12) The critical path activities have _____ float.
 - negative b) non zero a)
 - C) zero d) positive
- 13) Float is used for

C)

- Activities b) **Events** a)
- Nodes d) None of the above C)
- is the maximum delay possible for an activity without considering 14) any delay in its precedence or succeeding activity.
 - Total float a)
 - Continuous float
- b) Free float
- d) Independent float

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. 2 and Q.6 are compulsory. Answer any two questions out of remaining three questions from each section.

Civil Engineering ENGINEERING MANAGEMENT- II

2) Figures to the right indicate full marks.

Section – I

Q.2 a) Draw the Bar Chart for the project with following data and find the project 04 duration.

Activity	Preceding	Duration
	Activities	(days)
A		2
В		4
С		10
D	В	3
E	A,B	5
F	В	6
G	В	4
Н	C,D	1
I	G,H	7

- Differentiate between Bar chart and Milestone chart. b)
- Explain the Fulkerson's rule. c)
- In Table 1, activities and their uncertainty in duration captured in terms of 04 Q.3 a) optimistic, most likely and pessimistic duration (to, tm and tp respectively). Calculate the project duration.

Table 1 Activity ID IPA to t_m tp А 10 12 16 -В A 12 6 9 С 2 3 B,D 5 14 D 8 10 _ Е 5 8 D 6 F 2 3 Е 4 3 G -1 2 Н G 7 11 9 2 E.H 3 J 1

Max. Marks: 56

04

04



SLR-FM-66

Seat No.

04

04

b) Calculate the project duration. What is the critical path of the project network?

Activity	Predecessor	Duration
А	Nil	2
В	A	4
С	A	3
D	B,C	6
E	B,C	9
F	D,E	3

Q.4 a) For the following project indirect cost- Rs. 800 Day.

Activity	Predecessor	Normal	Crash	Normal	Crash
		Duration	Duration	Cost	Cost
		(Days)	(Days)	(Rs)	(Rs)
А	-	5	4	5000	7000
В	-	3	3	4000	-
С	A,B	3	1	3000	4500
D	В	4	2	8000	10000
E	C,D	5	3	4000	6000
F	E	2	1	7000	7500

Calculate

- a) The sequence of the activities in critical path.
- b) The slope of activity D.
- c) The direct cost of project if the duration is reduced to 13 days.
- d) The indirect cost of project if the duration is reduced to 14 days.
- e) The total cost of project if the duration is reduced to 14 days.
- f) Minimum total cost and optimal duration.

b) Prepare a network from following data. Answer the questions.

Activity	Predecessor	Duration	Resource
			rate/day
А	-	8	4
В	-	2	7
С	В	4	3
D	С	3	3
E	D	5	6
F	В	6	5

- 1) What is Critical path and duration
- 2) What is free flat of activities A and F
- 3) If all the activities started on early start (ES), when shall be the minimum daily resource requirement?
- 4) If all activities are started on early start (ES), what shall be the cumulative daily resource requirement on days 3, 6, 9, 12?
- 5) If only 11 units are available on a daily basis. On which days resources are over allocated if all activities start on early start (ES)?

Q.5 Explain

- a) The reports possible to be generated by a project management software.
- **b)** Information system planning design and implementation.

04



SLR-FM-66

04

SLR-FM-66 Set

Section – II

- Q.6 a) Project-A cost INR 100 crore to construct and an annual return of INR 40 04 crore is expected for next 5 years. On the other hand, project B costs INR 150 crore to construct and the expected annual return is INR 20 crore for next 15 years. Assume that the applicable rate of interest is 10%. Which project should be preferred by the owner based on their NPV? 04
 - Consider an equipment with an initial value of INR 50 lakhs (INR 5 b) million). It has been estimated that at the end of the service life of 5 years, the salvage value of the equipment is INR 5 lakhs. Assuming that the 'sum of years' method is used for calculating depreciation, what is the book value of the equipment after 3 years of operation? 04
 - Explain the different types of interest C)
- Q.7 Write a note on "Precedence Network" and its relation-ships presentation 80 a) with sketch.
 - When to apply Value Engineering? What are the application areas of b) value engineering?
- There are two alternatives for purchasing a concrete mixer. Both the **Q.8** a) 80 alternatives have same useful life. The cash flow details of alternatives are as follows:

Alternative- 1: Initial purchase cost = Rs.3,00,000, Annual operating and maintenance cost = Rs.20,000, Expected salvage value = Rs.1,25,000, Useful life = 5 years.

Alternative- 2: Initial purchase cost = Rs.2,00,000, Annual operating and maintenance cost = Rs.35,000, Expected salvage value = Rs.70,000, Useful life = 5 vears.

Using present worth method, find out which alternative should be selected, if the rate of interest is 10% per year.

Define Life Cycle Costing. What are its purpose and implications? b)

Q.9 Compare

- Discounting methods and Nondiscounting methods. a)
- EUAC method and IRR method. b)

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Seat

No.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

OPEN CHANNEL & RIVER HYDRAULICS

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

- At critical depth discharge is 1)
 - a) maximum for given specific energy
 - b) minimum for given specific energy
 - c) maximum for given specific force
 - d) minimum for given specific force
- Froude's number is defined as ratio of Inertia force to 2) a) Gravity force Viscous force b) c) Pressure force d) Surface tension force The difference between T.E.L and H.G.L. is 3) a) pressure head b) depth of flow c) velocity head d) none
- 4) Specific force represents the sum of pressure force and _____.
 - Datum head a)
 - b) Momentum flux per unit weight
 - c) Momentum flux and datum head
 - d) None
- For the trapezoidal section 5)
 - a) Side slope equal to 45°
 - b) Depth of flow equal to half bed width
 - c) Shape is of half hexagon
 - d) None

River plains are made up of ____ 6)

- a) Black soil Alluvium b)
- c) Red soil d) None

7) The momentum correction factor, β is given as _____

- a) $1/V^2 A \int \cdot V^3 dA$ b) $1/VA \int \cdot V. dA$ c) $1/V^3 A \int \cdot V^2 dA$
 - d) $1/V^2 A \int \cdot V^2 . dA$

The mean velocity in Lacey's regime channel is proportional to _____. 8)

- a) $R^{1/3}$ S^2 b)
- c) $R^{2/3}$ $So^{1/3}$ d)

SLR-FM-67



Max. Marks: 70

Marks: 14

- 9) Shield's diagram is a plot of non dimensional shear stress (τc) against .
 - a) Relative depth

Shear Reynold's number b) Reynold's number

raises water level

- c) Hydraulic radius
- Silting of reservoir _____. 10)
 - a) reduces efficiency of dam
 - c) reduces storage capacity
 - d) none
- The Lacey's equation for a regime channel consist of a set of 'x' independent 11) equation relating to flow, where 'x' is equal to _____.
 - a) 8 b) 6
 - c) 4 2 d)
- 12) Bed load is the term used to describe combination of _____.
 - a) contact load and wash load
 - b) contact load and saltation load
 - c) contact load and suspended load
 - d) only bed material load
- The dimension of shear stress is ____ 13)
 - ___. b) $ML^{-1}T^{-2}$ a) $ML^{-1}T^{-1}$
 - $ML^{-2}T^{-3}$ c) $ML^{-3}T^{-3}$ d)
- If froude's law of similitude exists between a model and prototype then 14) the force ratio is $f_r =$ _____.
 - a) Lr^3 b) Lr pr c) $Lr^3 \rho r$ d) $Lr^3 \rho r^{-1}$



SLR-FM-67

Set P

d)

b)

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL & RIVER HYDRAULICS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any four.

- a) The velocity distribution in rectangular channel of width 'B' and depth 'Yo' was approximated as $V = k_1 \sqrt{y}$ Where $k_1 = \text{constant}$; calculate the average velocity for the cross-section and correction coefficient ' α ' & ' β '.
- b) A 3.5 in wide rectangular channel covey's 10 m³/s of water with velocity 5 m/s. state is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- c) Derive the modified GVF equation and draw a neat sketch and show all details.
- **d)** A flow of 5.0 m³/s is passing at a depth of 1.2 m. through a rectangular channel of width 2.5 m. If ' α ' is 1.1 Determine specific energy of flow also determine the value of the depth alternative to the existing depth. If ' α ' = 1.0 (assumed for alternate depth flow).
- e) What do you understand by most economical channel section? and show that for trapezoidal section Half of top width= Length of one of sloping side and hydraulic mean depth= half the depth of flow

Q.3 Attempt any two.

- a) Define kinetic energy correction factor (α) and momentum correction factor (β) and derive their expressions.
- b) A discharge of 800 m³/s flows down a spillway and then passes on a 55 m. wide concrete apron (n= 0.012) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine
 - 1) Depth before the jump
 - 2) Length of jump
 - 3) Energy loss in jump
 - 4) Specific force at the toe
- c) Derive the modified equation for GVF and also state the assumptions made for it.

Max. Marks: 56

12

Q.4 Attempt any four.

- a) Explain
 - 1) River training works
 - 2) Meandering of river
- **b)** Differentiate between 'Kennedy's theory and Lacey's theory for channel design.
- c) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
- d) Draw a neat sketch of current meter and Explain its working in details.
- e) A model of water meter is tested in 100 mm diameter pipe. The discharge was 45 lit/sec and pressure difference is 0.11 n/mm². What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure?

Q.5 Attempt any two.

a)

- Design a regime channel by using Lacey's theory using the following data
- 1) Discharge 55 m³/sec
- 2) silt factor 1.1

b) Write short notes. (Any two)

- 1) River gauging and its types
- 2) Threshold motion of the sediment
- 3) Cut-off and spurs. (Draw neat sketch).
- c) Oil of kinematic viscosity is 5.5 x10⁻⁵ m²/sec is used in prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:8? Also find discharge ratio and time ratio for this model.

16

12

SLR-FM-67 Set P

No. B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering OPEN CHANNEL & RIVER HYDRAULICS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Seat

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

- The mean velocity in Lacey's regime channel is proportional to _____. 1)
 - a) $R^{1/3}$ S^2 b)
 - c) $R^{2/3}$ So^{1/3} d)
- 2) Shield's diagram is a plot of non dimensional shear stress (τc) against _____. Shear Reynold's number a) Relative depth b)

Reynold's number

raises water level

- c) Hydraulic radius d)
- 3) Silting of reservoir .
 - a) reduces efficiency of dam
 - c) reduces storage capacity d) none
- 4) The Lacey's equation for a regime channel consist of a set of 'x' independent equation relating to flow, where 'x' is equal to _____

b)

- a) 8 b) 6 2
- c) 4 d)
- Bed load is the term used to describe combination of _____. 5)
 - a) contact load and wash load
 - b) contact load and saltation load
 - c) contact load and suspended load
 - d) only bed material load
- The dimension of shear stress is ____ 6)
 - $ML^{-1}T^{-2}$ a) $ML^{-1}T^{-1}$ b) c) $ML^{-3}T^{-3}$ $ML^{-2}T^{-3}$ d)
- 7) If froude's law of similitude exists between a model and prototype then the force ratio is $f_r =$ _____.
 - a) Lr^3 b) Lr pr
 - c) $Lr^3 \rho r$ d) $Lr^3 or^{-1}$
- At critical depth discharge is 8)
 - a) maximum for given specific energy
 - b) minimum for given specific energy
 - c) maximum for given specific force
 - d) minimum for given specific force

SLR-FM-67



Max. Marks: 70

Marks: 14

			SLR-F	-M-	·67
			S	et	Q
Frc a) c)	oude's number is defined as ratio Gravity force Pressure force	of Ine b) d)	ertia force to Viscous force Surface tension force	_	
The a) c)	e difference between T.E.L and H pressure head velocity head	l.G.L. b) d)	is depth of flow none		
 Specific force represents the sum of pressure force and a) Datum head b) Momentum flux per unit weight c) Momentum flux and datum head d) None 					
Foi a) b) c) d)	the trapezoidal section Side slope equal to 45° Depth of flow equal to half bed v Shape is of half hexagon None	width			
Riv a) c)	er plains are made up of Black soil Red soil	b) d)	Alluvium None		
The momentum correction factor, β is given as a) $1/V^2 A \int \cdot V^3 dA$ b) $1/V A \int \cdot V dA$					

c) $1/V^3A\int \cdot V^2 dA$ d) $1/V^2A\int \cdot V^2 dA$

9)

10)

11)

12)

13)

14)

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL & RIVER HYDRAULICS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Draw neat sketches wherever necessary.

4) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any four.

- a) The velocity distribution in rectangular channel of width 'B' and depth 'Yo' was approximated as $V = k_1 \sqrt{y}$ Where $k_1 = \text{constant}$; calculate the average velocity for the cross-section and correction coefficient ' α ' & ' β '.
- b) A 3.5 in wide rectangular channel covey's 10 m³/s of water with velocity 5 m/s. state is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- c) Derive the modified GVF equation and draw a neat sketch and show all details.
- **d)** A flow of 5.0 m³/s is passing at a depth of 1.2 m. through a rectangular channel of width 2.5 m. If ' α ' is 1.1 Determine specific energy of flow also determine the value of the depth alternative to the existing depth. If ' α ' = 1.0 (assumed for alternate depth flow).
- e) What do you understand by most economical channel section? and show that for trapezoidal section Half of top width= Length of one of sloping side and hydraulic mean depth= half the depth of flow

Q.3 Attempt any two.

- a) Define kinetic energy correction factor (α) and momentum correction factor (β) and derive their expressions.
- b) A discharge of 800 m³/s flows down a spillway and then passes on a 55 m. wide concrete apron (n= 0.012) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine
 - 1) Depth before the jump
 - 2) Length of jump
 - 3) Energy loss in jump
 - 4) Specific force at the toe
- c) Derive the modified equation for GVF and also state the assumptions made for it.

Max. Marks: 56

12

Q.4 Attempt any four.

a) Explain

- 1) River training works
- 2) Meandering of river
- **b)** Differentiate between 'Kennedy's theory and Lacey's theory for channel design.
- c) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
- d) Draw a neat sketch of current meter and Explain its working in details.
- e) A model of water meter is tested in 100 mm diameter pipe. The discharge was 45 lit/sec and pressure difference is 0.11 n/mm². What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure?

Q.5 Attempt any two.

- a) Design a regime channel by using Lacey's theory using the following data
 - 1) Discharge 55 m³/sec
 - 2) silt factor 1.1

b) Write short notes. (Any two)

- 1) River gauging and its types
- 2) Threshold motion of the sediment
- 3) Cut-off and spurs. (Draw neat sketch).
- c) Oil of kinematic viscosity is 5.5 x10⁻⁵ m²/sec is used in prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:8? Also find discharge ratio and time ratio for this model.

16

12

SLR-FM-67 Set Q

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering OPEN CHANNEL & RIVER HYDRAULICS**

2) Figures to the right indicate full marks. 3) Draw neat sketches wherever necessary.

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

book.

		4) Use of non programmable calculator is permitted.	
		MCQ/Objective Type Questions	
Durat	ion: 3	0 Minutes Marks	s: 14
Q.1	Choo 1)	 bse the correct alternatives from the options. For the trapezoidal section a) Side slope equal to 45° b) Depth of flow equal to half bed width c) Shape is of half hexagon d) None 	14
	2)	River plains are made up ofa) Black soilb) Alluviumc) Red soild) None	
	3)	The momentum correction factor, β is given as a) $1/V^2 A \int \cdot V^3 . dA$ b) $1/V A \int \cdot V . dA$ c) $1/V^3 A \int \cdot V^2 . dA$ d) $1/V^2 A \int \cdot V^2 . dA$	
	4)	The mean velocity in Lacey's regime channel is proportional to a) $R^{1/3}$ b) S^2 c) $R^{2/3}$ d) $So^{1/3}$	
	5)	Shield's diagram is a plot of non dimensional shear stress (τc) againsta) Relative depthb) Shear Reynold's numberc) Hydraulic radiusd) Reynold's number	
	6)	Silting of reservoira) reduces efficiency of damb) raises water levelc) reduces storage capacityd) none	
	7)	The Lacey's equation for a regime channel consist of a set of 'x' independeequation relating to flow, where 'x' is equal toa) 8b) 6c) 4d) 2	ent
	8)	 Bed load is the term used to describe combination of a) contact load and wash load b) contact load and saltation load c) contact load and suspended load d) only bed material load 	
		Pa	ge 9 o

SLR-FM-67

Set

R

Max. Marks: 70

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer

Seat No.

9) The dimension of shear stress is _____

- $ML^{-1}T^{-2}$ a) $ML^{-1}T^{-1}$ b)
- c) $ML^{-3}T^{-3}$ $ML^{-2}T^{-3}$ d)
- If froude's law of similitude exists between a model and prototype then 10) the force ratio is $f_r =$ _____.
 - a) Lr^3 b) Lr pr $Lr^3 \rho r^{-1}$ c) $Lr^3 \rho r$ d)
- 11) At critical depth discharge is
 - _-· a) maximum for given specific energy
 - b) minimum for given specific energy
 - c) maximum for given specific force
 - d) minimum for given specific force

Froude's number is defined as ratio of Inertia force to _____. 12)

- a) Gravity force Viscous force b)
- c) Pressure force Surface tension force d)
- The difference between T.E.L and H.G.L. is _____ 13)
 - a) pressure head
- depth of flow b)

SLR-FM-67

Set

- c) velocity head d) none
- Specific force represents the sum of pressure force and _____. 14)
 - a) Datum head
 - b) Momentum flux per unit weight
 - c) Momentum flux and datum head
 - d) None

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL & RIVER HYDRAULICS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any four.

- a) The velocity distribution in rectangular channel of width 'B' and depth 'Yo' was approximated as $V = k_1 \sqrt{y}$ Where $k_1 = \text{constant}$; calculate the average velocity for the cross-section and correction coefficient ' α ' & ' β '.
- b) A 3.5 in wide rectangular channel covey's 10 m³/s of water with velocity 5 m/s. state is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- c) Derive the modified GVF equation and draw a neat sketch and show all details.
- **d)** A flow of 5.0 m³/s is passing at a depth of 1.2 m. through a rectangular channel of width 2.5 m. If ' α ' is 1.1 Determine specific energy of flow also determine the value of the depth alternative to the existing depth. If ' α ' = 1.0 (assumed for alternate depth flow).
- e) What do you understand by most economical channel section? and show that for trapezoidal section Half of top width= Length of one of sloping side and hydraulic mean depth= half the depth of flow

Q.3 Attempt any two.

- a) Define kinetic energy correction factor (α) and momentum correction factor (β) and derive their expressions.
- b) Å discharge of 800 m³/s flows down a spillway and then passes on a 55 m. wide concrete apron (n= 0.012) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine
 - 1) Depth before the jump
 - 2) Length of jump
 - 3) Energy loss in jump
 - 4) Specific force at the toe
- c) Derive the modified equation for GVF and also state the assumptions made for it.

Max. Marks: 56

12

Q.4 Attempt any four.

a) Explain

- 1) River training works
- 2) Meandering of river
- **b)** Differentiate between 'Kennedy's theory and Lacey's theory for channel design.
- c) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
- d) Draw a neat sketch of current meter and Explain its working in details.
- e) A model of water meter is tested in 100 mm diameter pipe. The discharge was 45 lit/sec and pressure difference is 0.11 n/mm². What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure?

Q.5 Attempt any two.

- a) Design a regime channel by using Lacey's theory using the following data
 - 1) Discharge 55 m³/sec
 - 2) silt factor 1.1

b) Write short notes. (Any two)

- 1) River gauging and its types
- 2) Threshold motion of the sediment
- 3) Cut-off and spurs. (Draw neat sketch).
- c) Oil of kinematic viscosity is 5.5 x10⁻⁵ m²/sec is used in prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:8? Also find discharge ratio and time ratio for this model.

16

12

SLR-FM-67 Set R
B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

OPEN CHANNEL & RIVER HYDRAULICS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat No.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

Silting of reservoir 1)

Duration: 30 Minutes

- a) reduces efficiency of dam
- c) reduces storage capacity d)
- The Lacey's equation for a regime channel consist of a set of 'x' independent 2) equation relating to flow, where 'x' is equal to _____.

b)

none

raises water level

- a) 8 b) 6
- 2 c) 4 d)
- Bed load is the term used to describe combination of _____. 3)
 - a) contact load and wash load
 - b) contact load and saltation load
 - c) contact load and suspended load
 - d) only bed material load
- 4) The dimension of shear stress is ____
 - $ML^{-1}T^{-2}$ a) $ML^{-1}T^{-1}$ b)
 - c) $ML^{-3}T^{-3}$ $ML^{-2}T^{-3}$ d)

If froude's law of similitude exists between a model and prototype then 5) the force ratio is $f_r =$ _____.

- a) Lr^3 b) Lr pr Lr^3 or $^{-1}$ c) Lr^3 or d)
- 6) At critical depth discharge is
 - a) maximum for given specific energy
 - b) minimum for given specific energy
 - c) maximum for given specific force
 - d) minimum for given specific force

Froude's number is defined as ratio of Inertia force to _____. 7)

- a) Gravity force Viscous force b) c) Pressure force
 - d)
- The difference between T.E.L and H.G.L. is 8)
 - a) pressure head
 - c) velocity head
- Surface tension force
- b) depth of flow
- d) none

SLR-FM-67



Max. Marks: 70

Marks: 14

Set S 9) Specific force represents the sum of pressure force and _____. a) Datum head b) Momentum flux per unit weight c) Momentum flux and datum head d) None For the trapezoidal section _____. 10) a) Side slope equal to 45° b) Depth of flow equal to half bed width c) Shape is of half hexagon d) None River plains are made up of _____. 11) b) a) Black soil Alluvium c) Red soil d) None 12) The momentum correction factor, β is given as _____. $1/VA \int \cdot V. dA$ a) $1/V^2 A \int \cdot V^3 . dA$ b) c) $1/V^3 A \int V^2 dA$ d) $1/V^2 A \int \cdot V^2 . dA$ The mean velocity in Lacey's regime channel is proportional to _____. 13) S^2 a) $R^{1/3}$ b) c) $R^{2/3}$ So^{1/3} d) 14) Shield's diagram is a plot of non dimensional shear stress (τc) against _____. a) Relative depth Shear Reynold's number b)

- c) Hydraulic radius
- d) Reynold's number

SLR-FM-67

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL & RIVER HYDRAULICS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any four.

- a) The velocity distribution in rectangular channel of width 'B' and depth 'Yo' was approximated as $V = k_1 \sqrt{y}$ Where $k_i = \text{constant}$; calculate the average velocity for the cross-section and correction coefficient ' α ' & ' β '.
- b) A 3.5 in wide rectangular channel covey's 10 m³/s of water with velocity 5 m/s. state is there formation of hydraulic jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water.
- c) Derive the modified GVF equation and draw a neat sketch and show all details.
- **d)** A flow of 5.0 m³/s is passing at a depth of 1.2 m. through a rectangular channel of width 2.5 m. If ' α ' is 1.1 Determine specific energy of flow also determine the value of the depth alternative to the existing depth. If ' α ' = 1.0 (assumed for alternate depth flow).
- e) What do you understand by most economical channel section? and show that for trapezoidal section Half of top width= Length of one of sloping side and hydraulic mean depth= half the depth of flow

Q.3 Attempt any two.

- a) Define kinetic energy correction factor (α) and momentum correction factor (β) and derive their expressions.
- b) A discharge of 800 m³/s flows down a spillway and then passes on a 55 m. wide concrete apron (n= 0.012) the velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m the channel below causes a hydraulic jump on the horizontal apron. Determine
 - 1) Depth before the jump
 - 2) Length of jump
 - 3) Energy loss in jump
 - 4) Specific force at the toe
- c) Derive the modified equation for GVF and also state the assumptions made for it.

Max. Marks: 56

12

Q.4 Attempt any four.

a) Explain

- 1) River training works
- 2) Meandering of river
- **b)** Differentiate between 'Kennedy's theory and Lacey's theory for channel design.
- c) Explain 'Similitude' and what are its types? and derive the equation for Froude's number.
- d) Draw a neat sketch of current meter and Explain its working in details.
- e) A model of water meter is tested in 100 mm diameter pipe. The discharge was 45 lit/sec and pressure difference is 0.11 n/mm². What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure?

Q.5 Attempt any two.

- a) Design a regime channel by using Lacey's theory using the following data
 - 1) Discharge 55 m³/sec
 - 2) silt factor 1.1

b) Write short notes. (Any two)

- 1) River gauging and its types
- 2) Threshold motion of the sediment
- 3) Cut-off and spurs. (Draw neat sketch).
- c) Oil of kinematic viscosity is 5.5 x10⁻⁵ m²/sec is used in prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:8? Also find discharge ratio and time ratio for this model.

16

12

SLR-FM-67 Set S

Seat No. B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** AIR POLUTION AND CONTROL

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- Assume suitable data if necessary.

MCQ/Objective Type Questions

b)

d)

Duration: 30 Minutes

3)

Q.1 Choose the correct alternatives from the options.

- 1) Photochemical smog reduces considerably. Lapse rate b)
 - a) Visibility
 - c) Odour d) Land pollution
- 2) In ESP particulates are separated by virtue of action.
 - a) Gravitational acceleration
 - c) Electrostatic
 - can remove
 - a) Scrubers, Water soluble Gases
 - b) Gravity settler. Particulates
 - c) Adsorption tower, organic gases
 - d) All of above
- 4) Velocity of gas flow in gravity settler should be less than _____ m/s for excellent results.
 - a) 0.3 b) 0.5 3.1 d) 10 c)
- is the First step in removal of particles in ESP. 5)
 - a) Charge neutralization c) Collection of particles
- b) Charging of particles
- d) Ionization of gas

centrifugal

diffusion

- 6) is needed in stack monitoring in order to obtain true and representative samples from stack. a) Over isokinetic sampling
 - b) Under isokinetic sampling
 - c) Isokinetic sampling d)
- 7) is commonly found carcinogenic indoor pollutant.
 - a) Ozone b)
 - c) Both a and b d) Uranium
- Choose the control equipment with highest particulate removal efficiency 8) Cyclone, Scrubber, ESP, Gravity settler, Bag house _____.
 - Bag house Cyclone a) b) Gravity settler ESP c) d)

SLR-FM-68



Max. Marks: 70

Marks: 14

- None of these
- - Radon

9)	Cyc a) c)	clonic Scubber is a type of Stack monitoring kit Wet collector	b) d)	Dry collector Bag house filter
10)	Cor a) b) c) d)	ncentration of SPM in ambient air Stack monitoring kit Auto exhaust analyzer High volume sampler or respirat All of above	can I ble du	be determined by using
11)	Cor a)	nsider four pollutants O_3 , NO_2 , PE is a primary pollutant. O_3	3N an b)	d PAN. Out of these pollutants
	c)	PBN	d)	None of above
12)	Mol	ecular mass of H ₂ S is gra	ms/ m	nole.
	a)	44	b)	48
	c)	34	d)	28
13)		are categorized under dry col	lector	S.
	a)	Venturi scrubber	b)	Spray tower
	C)	Cyclonic scrubber	d)	Cyclone separator
14)	Thi	ckness of troposphere is approxir	nately	/ km.
	a)	35	b)	11
	C)	39	a)	200

Set P

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering AIR POLUTION AND CONTROL

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM Max. Marks: 56

SLR-FM-68

Set

Instructions: 1) Solve any two questions from section – I and any two questions from section- II.

- 2) Q. No.3 compulsory from section-I and Q.No.7 compulsory from section II.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

Section – I

Q.2	a)	Define air pollution based on composition of clean air.	03

- b) Discuss detailed classification of sources of air *pollutants.* 06
- Q.3 a) Explain adiabatic cooling process with the help of neat sketches.
 04
 b) 1) The average daily concentration of sulfur dioxide is 415
 06
 - b) 1) The average daily concentration of sulfur dioxide is 415 micrograms/m³ at 25^oC and 1 atmospheric pressure. What is concentration of SO₂ in ppm?
 - The ozone concentration is observed to be 118 microgram/m3 at 25^oC and 1 atmospheric pressure. Estimate its concentration in ppm.
- **Q.4 a)** Sulphur dioxide is emitted from a stack at a rate of 160 gm/sec. Effective **03** height of stack is 60 m. The wind speed at stack top is 6 m/sec. The atmospheric stability class is D. Determine the ground level concentration along the centre line at a distance of 500 m (i.e. C (500m.0.0.H)) from the stack. Assume σ y= 36 m and σ z 18.5 m.
 - b) Write GDM and explain each and every term in it. 06

Q.5 Write short notes (Any three)

- a) Types of inversion
- b) Acid rain
- c) Wind velocity profile
- d) London Smog and Bhopal Gas tragedy

Section – II

- Q.6 a) Explain various mechanisms involved in different particulate separation in 05 air pollution control equipments.
 - b) Two air pollution control equipments (Gravity settling chamber and Cyclone) are connected in series. Efficiencies of settling chamber and cyclone are 80% and 75% respectively. Determine overall efficiency of the system.
- **Q.7 a)** Explain working of ESP with neat sketch. Also write advantages and **04** disadvantages.



09

- b) In a Air pollution survey following observations were recorded with high volume sampler.
 - 1) Avg temp of air = 27° C
 - 2) Avg pressure of air = 760 mm of hg
 - 3) Initial sampling rate = $1.6 \text{ m}^3/\text{min}$
 - 4) Final sampling rate = $1.4 \text{ m}^3/\text{min}$
 - 5) Duration of sampling = 8 hrs
 - 6) Wt. of filter before sampling = 3.06 gm
 - 7) Wt. of filter after sampling = 3.60 gm

Estimate concentration of SPM im micrograms/m³. (No need to apply correction)

- Q.8 a) List out various methods used in gaseous pollution control. ExplainO4 Catalytic incineration with neat sketch.
 - b) What is photochemical smog? Explain photochemical reactions with the **05** help of chemical equations. What are effects of photochemical smog?

Q.9 Write short note (any three)

- a) Bag house filter
- b) Automobile pollution and its control
- c) Spray tower
- d) Isokinetic sampling

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

AIR POLUTION AND CONTROL

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

1) Choose the control equipment with highest particulate removal efficiency Cyclone, Scrubber, ESP, Gravity settler, Bag house _____.

d)

Cyclone

ESP

- Bag house a) b)
- c) Gravity settler
- Cyclonic Scubber is a type of _____. 2)
 - b) Dry collector a) Stack monitoring kit
 - c) Wet collector Bag house filter d)

Concentration of SPM in ambient air can be determined by using _____. 3)

- a) Stack monitoring kit
- b) Auto exhaust analyzer
- c) High volume sampler or respirable dust sampler
- d) All of above

4) Consider four pollutants O₃, NO₂, PBN and PAN. Out of these pollutants is a primary pollutant.

- a) O_3 b) NO₂ c) PBN None of above d)
- Molecular mass of H₂S is _____ grams/ mole. 5)
 - a) 44 b) 48 c) 34 d) 28
- are categorized under dry collectors. 6)
 - a) Venturi scrubber b) Spray tower
 - c) Cyclonic scrubber Cyclone separator d)
- Thickness of troposphere is approximately _ 7) km.
 - 11 a) 35 b)
 - c) 39 d) 500
- 8) Photochemical smog reduces _____ considerably.
 - a) Visibility b) Lapse rate
 - c) Odour Land pollution d)
- In ESP particulates are separated by virtue of _____ action. 9) centrifugal
 - a) Gravitational acceleration b) d) diffusion
 - c) Electrostatic

SLR-FM-68

Set

Max. Marks: 70

Q

Marks: 14 14 10) _____ can remove _____.

- a) Scrubers, Water soluble Gases
- b) Gravity settler. Particulates
- c) Adsorption tower, organic gases
- d) All of above
- 11) Velocity of gas flow in gravity settler should be less than _____ m/s for excellent results.
 - a) 0.3 b)
 - c) 3.1 d) 10
- 12) _____ is the First step in removal of particles in ESP.
 - b) Charging of particles
 - a) Charge neutralizationc) Collection of particles
- d) Ionization of gas

SLR-FM-68

Set

- 13) _____ is needed in stack monitoring in order to obtain true and representative samples from stack.
 - a) Over isokinetic sampling
 - b) Under isokinetic samplingd) None of these
 - c) Isokinetic sampling d)
- 14) _____ is commonly found carcinogenic indoor pollutant.
 - a) Ozone

c)

b) Radon

0.5

- Both a and b
- d) Uranium

Set

Max. Marks: 56

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering AIR POLUTION AND CONTROL

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Solve any two questions from section – I and any two questions from section- II.

- 2) Q. No.3 compulsory from section-I and Q.No.7 compulsory from section II.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

Section – I

Q.2	a)	Define air pollution based on composition of clean air.	03
	b)	Discuss detailed classification of sources of air pollutants.	06

- **Q.3 a)** Explain adiabatic cooling process with the help of neat sketches. **04**
 - a) Explain adiabatic cooling process with the help of neat sketches.
 b) 1) The average daily concentration of sulfur dioxide is 415
 06
 - The average daily concentration of sulfur dioxide is 415 micrograms/m³ at 25^oC and 1 atmospheric pressure. What is concentration of SO₂ in ppm?
 - The ozone concentration is observed to be 118 microgram/m3 at 25^oC and 1 atmospheric pressure. Estimate its concentration in ppm.
- **Q.4 a)** Sulphur dioxide is emitted from a stack at a rate of 160 gm/sec. Effective **03** height of stack is 60 m. The wind speed at stack top is 6 m/sec. The atmospheric stability class is D. Determine the ground level concentration along the centre line at a distance of 500 m (i.e. C (500m.0.0.H)) from the stack. Assume σ y= 36 m and σ z 18.5 m.
 - b) Write GDM and explain each and every term in it. 06

Q.5 Write short notes (Any three)

- a) Types of inversion
- b) Acid rain
- c) Wind velocity profile
- d) London Smog and Bhopal Gas tragedy

Section – II

- **Q.6 a)** Explain various mechanisms involved in different particulate separation in **05** air pollution control equipments.
 - b) Two air pollution control equipments (Gravity settling chamber and O4 Cyclone) are connected in series. Efficiencies of settling chamber and cyclone are 80% and 75% respectively. Determine overall efficiency of the system.
- **Q.7 a)** Explain working of ESP with neat sketch. Also write advantages and **04** disadvantages.

Set Q

09

- b) In a Air pollution survey following observations were recorded with high volume sampler.
 - 1) Avg temp of air = 27° C
 - 2) Avg pressure of air = 760 mm of hg
 - 3) Initial sampling rate = $1.6 \text{ m}^3/\text{min}$
 - 4) Final sampling rate = $1.4 \text{ m}^3/\text{min}$
 - 5) Duration of sampling = 8 hrs
 - 6) Wt. of filter before sampling = 3.06 gm
 - 7) Wt. of filter after sampling = 3.60 gm

Estimate concentration of SPM im micrograms/m³. (No need to apply correction)

- Q.8 a) List out various methods used in gaseous pollution control. ExplainO4 Catalytic incineration with neat sketch.
 - **b)** What is photochemical smog? Explain photochemical reactions with the **05** help of chemical equations. What are effects of photochemical smog?

Q.9 Write short note (any three)

- a) Bag house filter
- b) Automobile pollution and its control
- c) Spray tower
- d) Isokinetic sampling

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

AIR POLUTION AND CONTROL

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 1) is the First step in removal of particles in ESP.
 - a) Charge neutralization c) Collection of particles
- Charging of particles b) d) Ionization of gas

None of these

Under isokinetic sampling

- 2) is needed in stack monitoring in order to obtain true and representative samples from stack.
 - a) Over isokinetic sampling
 - c) Isokinetic sampling
- is commonly found carcinogenic indoor pollutant. 3)
 - Ozone b) Radon a)
 - c) Both a and b Uranium d)
- 4) Choose the control equipment with highest particulate removal efficiency Cyclone, Scrubber, ESP, Gravity settler, Bag house _____.

b)

d)

- a) Bag house b) Cyclone
- c) Gravity settler ESP d)
- Cyclonic Scubber is a type of _____. 5)
 - Stack monitoring kit b) Dry collector a)
 - Wet collector C) d) Bag house filter

Concentration of SPM in ambient air can be determined by using _____. 6)

- a) Stack monitoring kit
- b) Auto exhaust analyzer
- c) High volume sampler or respirable dust sampler
- d) All of above
- 7) Consider four pollutants O₃, NO₂, PBN and PAN. Out of these pollutants _ is a primary pollutant.
 - a) O_3 b) NO₂
 - c) PBN d) None of above
- Molecular mass of H₂S is _____ grams/ mole. 8)
 - a) 44 b) 48
 - c) 34 d) 28
- 9) ____ are categorized under dry collectors.
 - a) Venturi scrubber b) Spray tower
 - c) Cyclonic scrubber d) Cyclone separator

SLR-FM-68

Set



Marks: 14

14

R

SLR-FM-68 Set R

- 10) Thickness of troposphere is approximately _____ km.
 - a) 35 b) 11
 - c) 39 d) 500
- 11) Photochemical smog reduces _____ considerably.
 - a) Visibility b) Lapse rate
 - c) Odour d) Land pollution
- 12) In ESP particulates are separated by virtue of _____ action.
 - a) Gravitational acceleration b) centrifugal
 - c) Electrostatic d) diffusion
- 13) _____ can remove ____
 - a) Scrubers, Water soluble Gases
 - b) Gravity settler. Particulates
 - c) Adsorption tower, organic gases
 - d) All of above
- 14) Velocity of gas flow in gravity settler should be less than _____ m/s for excellent results.
 - a) 0.3 b) 0.5
 - c) 3.1 d) 10

Max. Marks: 56

Civil Engineering	
AIR POLUTION AND CONTRO	L

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Solve any two questions from section – I and any two questions from section- II.

- 2) Q. No.3 compulsory from section-I and Q.No.7 compulsory from section II.
- 2) Figures to the right indicate full marks.
- Assume suitable data if necessary.

Section – I

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019

Q.2	a)	Define air pollution based on composition of clean air.	03

- Discuss detailed classification of sources of air *pollutants*. b) 06
- Q.3 a) Explain adiabatic cooling process with the help of neat sketches. 04
 - The average daily concentration of sulfur dioxide is 415 b) 1) micrograms/m³ at 25^oC and 1 atmospheric pressure. What is concentration of SO₂ in ppm?
 - The ozone concentration is observed to be 118 microgram/m3 at 25° C 2) and 1 atmospheric pressure. Estimate its concentration in ppm.
- Sulphur dioxide is emitted from a stack at a rate of 160 gm/sec. Effective 03 Q.4 a) height of stack is 60 m. The wind speed at stack top is 6 m/sec. The atmospheric stability class is D. Determine the ground level concentration along the centre line at a distance of 500 m (i.e. C (500m.0.0.H)) from the stack. Assume σy = 36 m and σz 18.5 m.
 - Write GDM and explain each and every term in it. 06 b)

Q.5 Write short notes (Any three)

- Types of inversion a)
- b) Acid rain
- Wind velocity profile C)
- London Smog and Bhopal Gas tragedy d)

Section – II

- Explain various mechanisms involved in different particulate separation in 05 Q.6 a) air pollution control equipments.
 - Two air pollution control equipments (Gravity settling chamber and 04 b) Cyclone) are connected in series. Efficiencies of settling chamber and cyclone are 80% and 75% respectively. Determine overall efficiency of the system.
- Explain working of ESP with neat sketch. Also write advantages and 04 Q.7 a) disadvantages.

Set

Seat No.

06

Set | R

- b) In a Air pollution survey following observations were recorded with high volume sampler.
 - 1) Avg temp of air = 27° C
 - 2) Avg pressure of air = 760 mm of hg
 - 3) Initial sampling rate = $1.6 \text{ m}^3/\text{min}$
 - 4) Final sampling rate = $1.4 \text{ m}^3/\text{min}$
 - 5) Duration of sampling = 8 hrs
 - 6) Wt. of filter before sampling = 3.06 gm
 - 7) Wt. of filter after sampling = 3.60 gm

Estimate concentration of SPM im micrograms/m³. (No need to apply correction)

- Q.8 a) List out various methods used in gaseous pollution control. Explain 04 Catalytic incineration with neat sketch.
 - b) What is photochemical smog? Explain photochemical reactions with the **05** help of chemical equations. What are effects of photochemical smog?

Q.9 Write short note (any three)

- a) Bag house filterb) Automobile pollution and its control
- c) Spray tower
- d) Isokinetic sampling

book. 2) Figures to the right indicate full marks. Assume suitable data if necessary. MCQ/Objective Type Questions **Duration: 30 Minutes** Choose the correct alternatives from the options. Concentration of SPM in ambient air can be determined by using _____. a) Stack monitoring kit b) Auto exhaust analyzer c) High volume sampler or respirable dust sampler d) All of above

2) Consider four pollutants O₃, NO₂, PBN and PAN. Out of these pollutants is a primary pollutant.

a) O_3 b) NO₂ None of above c) PBN d)

3) Molecular mass of H_2S is _____ grams/ mole.

- 44 48 a) b)
- c) 34 28 d)

4) are categorized under dry collectors.

- Venturi scrubber Spray tower a) b)
- c) Cyclonic scrubber Cyclone separator d)
- Thickness of troposphere is approximately km. 5)
 - 11 a) 35 b) c) 39 d) 500

6) Photochemical smog reduces _____ considerably.

- Lapse rate a) Visibility b) c) Odour d) Land pollution
- In ESP particulates are separated by virtue of action.

diffusion

d)

- 7) centrifugal Gravitational acceleration a) b)
 - c) Electrostatic
 - can remove
 - a) Scrubers, Water soluble Gases
 - b) Gravity settler. Particulates
 - c) Adsorption tower, organic gases
 - d) All of above

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** AIR POLUTION AND CONTROL

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

Max. Marks: 70

SLR-FM-68

Set

Seat No.

Q.1

1)

8)

Marks: 14

9)	Velocity of gas flow in gravity settler should be less than	m/s for
	excellent results.	

- a) 0.3 b) 0.5
- c) 3.1 d) 10
- 10) _____ is the First step in removal of particles in ESP.
 - a) Charge neutralization b) Charging of particles
 - c) Collection of particles
- d) Ionization of gas
- 11) _____ is needed in stack monitoring in order to obtain true and representative samples from stack.
 - a) Over isokinetic sampling
- b) Under isokinetic sampling

Set S

- c) Isokinetic sampling d) None of these
- 12) _____ is commonly found carcinogenic indoor pollutant.
 - a) Ozone b) Radon
 - c) Both a and b d) Uranium
- 13) Choose the control equipment with highest particulate removal efficiency Cyclone, Scrubber, ESP, Gravity settler, Bag house _____.
 - a) Bag house b) Cyclone
 - c) Gravity settler d) ESP
- 14) Cyclonic Scubber is a type of _____.
 - a) Stack monitoring kit b)
 - c) Wet collector

- Dry collector
- d) Bag house filter

Max. Marks: 56

Page 15 of 16

09

Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering AIR POLUTION AND CONTROL

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Solve any two questions from section – I and any two questions from section- II.

- 2) Q. No.3 compulsory from section-I and Q.No.7 compulsory from section II.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

Section – I

Q.2	a)	Define air pollution based on composition of clean air.	03
	b)	Discuss detailed classification of sources of air pollutants.	06

- Q.3 a) Explain adiabatic cooling process with the help of neat sketches. 04
 - b) 1) The average daily concentration of sulfur dioxide is 415 06
 - micrograms/m³ at 25° C and 1 atmospheric pressure. What is concentration of SO₂ in ppm?
 - The ozone concentration is observed to be 118 microgram/m3 at 25^oC and 1 atmospheric pressure. Estimate its concentration in ppm.
- **Q.4 a)** Sulphur dioxide is emitted from a stack at a rate of 160 gm/sec. Effective **03** height of stack is 60 m. The wind speed at stack top is 6 m/sec. The atmospheric stability class is D. Determine the ground level concentration along the centre line at a distance of 500 m (i.e. C (500m.0.0.H)) from the stack. Assume σ y= 36 m and σ z 18.5 m.
 - b) Write GDM and explain each and every term in it. 06

Q.5 Write short notes (Any three)

- a) Types of inversion
- b) Acid rain
- c) Wind velocity profile
- d) London Smog and Bhopal Gas tragedy

Section – II

- **Q.6 a)** Explain various mechanisms involved in different particulate separation in **05** air pollution control equipments.
 - b) Two air pollution control equipments (Gravity settling chamber and O4 Cyclone) are connected in series. Efficiencies of settling chamber and cyclone are 80% and 75% respectively. Determine overall efficiency of the system.
- **Q.7 a)** Explain working of ESP with neat sketch. Also write advantages and **04** disadvantages.



Set S

09

- b) In a Air pollution survey following observations were recorded with high volume sampler.
 - 1) Avg temp of air = 27° C
 - 2) Avg pressure of air = 760 mm of hg
 - 3) Initial sampling rate = $1.6 \text{ m}^3/\text{min}$
 - 4) Final sampling rate = $1.4 \text{ m}^3/\text{min}$
 - 5) Duration of sampling = 8 hrs
 - 6) Wt. of filter before sampling = 3.06 gm
 - 7) Wt. of filter after sampling = 3.60 gm

Estimate concentration of SPM im micrograms/m³. (No need to apply correction)

- Q.8 a) List out various methods used in gaseous pollution control. Explain 04 Catalytic incineration with neat sketch.
 - **b)** What is photochemical smog? Explain photochemical reactions with the **05** help of chemical equations. What are effects of photochemical smog?

Q.9 Write short note (any three)

- a) Bag house filter
 - b) Automobile pollution and its control
 - c) Spray tower
 - d) Isokinetic sampling

Seat No.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Make suitable assumption, if necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic calculator and relevant I.S codes are allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- Three piles are arranged in triangular form, efficiency of this pile group by 1) Feld's rule is _____.
 - a) 33.33% b) 97% d) 87.5% 75% c)
- What were the values for soil parameters used by Terzaghi for his local 2) shear failure analysis?
 - $\Phi_{\rm m} = \frac{2}{3} \tan \Phi, C_{\rm m} = \frac{2}{3} c$ $\Phi_{\rm m} = \frac{1}{2} \tan \Phi, C = \frac{1}{2} c$ b) $\Phi_{\rm m} = \frac{3}{4} \tan \Phi$, $C = \frac{3}{4} c$ a) none of these d) C)
- A cyclic load test is performed to determine a pile's _____. 3)
 - Ultimate load capacity under repetition a)
 - b) Skin resistance and base resistance separately
 - Skin resistance c)
 - Tip resistance d)

The efficiency of pile group depends on 4) method of pile installation

- soil type a)
- all of these c) pile spacing d)
- Geophysical surveys are not useful for 5)
 - large areas Complex boundary layers a) b)
 - Underground cavities locating water tables d) c)
- During the process of well sinking, in order to overcome skin friction and 6) loss in weight of the well due to buoyancy, the term that is applied is_
 - a) Kentiledge b) Bed rock
 - Cutting edge d) Steining c)
- 7) With increase in the size of footing the bearing capacity of footing on clay _____.

b)

- Decreases a) Increases b)
- **Remains same** None of these c) d)

SLR-FM-69 Set

Max. Marks: 70

Marks: 14

- Bored piles are pilles. Large displacement b) Non displacement a) Small displacement None of the above C) d) Resonance in machine foundation occurs when frequency ratio is _____. a) Zero b) less than 1 C) Greater than 1 d) Equal to one The floating caisson is Open at top closed at bottom b) closed at top open at bottom a) Open at top and bottom both None of the above C) d) In under reamed pile construction, the ratio of shaft diameter to bulb 11) diameter is _____. a) 1/1.5 b) 1/2 C) 1/2.5 d) 1/4 SPT test will be stopped when. 12) 10 successive blows produce no advance a) 50 blows required for 150mm penetration b) Both a and b C) d) Either a or b 13) Pressure meter test is developed by _ Taylor a) Terzaghi's b) Cassagrande Menard C) d) 14) The bottom plug in well foundation is usually made up of _____.
 - a) Brick Masonry

- RCC b)
- Cement Concrete d) Steel C)

- 8)
- 9)
- 10)

- SLR-FM-69
 - Set

		2) Figure to the right indicates full marks.	
		Section – I	
Q.2	a) b)	Discuss the major criteria to be satisfied in the design of foundation? A footing 2.25 m square is located at a depth of 1.5 m in a sand of unit weight 18 kN/m ³ . The shear strength parameters are c= 0, \emptyset = 36°. Calculate the safe load carried by the footing against complete shear failure. FOS against shear failure is 3. Use Terzaghi's analysis. N _c = 65.4, N _q = 49.4, N _Y = 54	04 05
Q.3	a) b)	Discuss the limitation of plate load test. Explain in which situation raft foundation is needed? What are the IS Code provision for it?	05 04
Q.4	a) b)	A footing 3 m x 2 m in plan transmits a pressure of 130 kN /m ² on a cohesive soil having E = 6 x 10 ⁴ kN /m and μ = 0.50. Determine the immediate settlement of the footing at the centre. Write note on standard penetration test?	05 04
о F			40
Q.0	a) b) c) d)	Foundation techniques in B.C.soil Types of samplers IS code method of bearing capacity Settlement in raft foundation	10
		Section – II	
Q.6	a) b)	Explain types of piles with neat sketch. A group of 9 piles with 3 piles in row were driven into soft clay extending from ground level up to a great depth. The dia and the length of piles were 25 cm and 10 m respectively. The unconfined compressive strength of the clay is 120 kPa. If the piles are placed at 100 cm c/c, compute the allowable load on the pile group. Take factor of safety = 2.5 For \emptyset = 0, Nc = 9. Take adhesion factor as 0.75.	04 05
Q.7	a)	Draw a neat sketch of a typical arrangement of a hammer foundation with a frame.	05
	b)	Discuss the construction process of Box caisson.	04
Q.8	a) b)	Discuss vibration isolation of machine foundation. Draw the sketch of block foundation with all 6 degrees of freedom. (3 translations and 3 rotations).	04 05

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No 5 & Q. No. 9 are compulsory.

- 2) Solve any two questions from each section.2) Figure to the right indicates full marks.

SLR-FM-69

Max. Marks: 56

Set P

Seat

No.

Q.9 Write note on any Two.a) Methods of Shoringb) Pneumatic caisson

- c) Vibration absorbers
- d) Criteria for satisfaction performance of machine foundation

Seat No.	Set	Q
B.E. (Part – I) (New) (DESIG	(CBCS) Examination Nov/Dec-2019 Civil Engineering SN OF FOUNDATIONS	
Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM	Max. Mark	s: 70
Instructions: 1) Q. No. 1 is compul	sory and should be solved in first 30 minutes in an	swer

book.

2) Make suitable assumption, if necessary and mention it clearly. 3) Figures to the right indicate full marks. Use of electronic calculator and relevant I.S codes are allowed. **MCQ/Objective Type Questions Duration: 30 Minutes** Q.1 Choose the correct alternatives from the options. 14 Bored piles are _____ pilles. 1) Large displacement a) b) Non displacement Small displacement c) d) None of the above 2) Resonance in machine foundation occurs when frequency ratio is _____. less than 1 a) Zero b) Greater than 1 Equal to one C) d) 3) The floating caisson is Open at top closed at bottom closed at top open at bottom b) a) Open at top and bottom both None of the above C) d) 4) In under reamed pile construction, the ratio of shaft diameter to bulb diameter is . a) 1/1.5 b) 1/2 C) 1/2.5d) 1/4SPT test will be stopped when. 5) 10 successive blows produce no advance a) 50 blows required for 150mm penetration b) Both a and b C) d) Either a or b Pressure meter test is developed by 6) Taylor a) Terzaghi's b) Cassagrande d) Menard C) The bottom plug in well foundation is usually made up of _____. 7) a) Brick Masonry RCC b) **Cement Concrete** d) Steel C) Three piles are arranged in triangular form, efficiency of this pile group by 8) Feld's rule is _____. 97% 33.33% b) a) c) 75% d) 87.5%



Marks: 14

				Set	Q
9)	Wha shea a) c)	at were the values for soil parameter ar failure analysis? $\Phi_{m} = \frac{2}{3} \tan \Phi, C_{m} = \frac{2}{3} c$ $\Phi_{m} = \frac{1}{2} \tan \Phi, C = \frac{1}{2} c$	ters u b) d)	used by Terzaghi for his local $\Phi_{\rm m} = \frac{3}{4} \tan \Phi$, $C = \frac{3}{4}c$ none of these	
10)	A cy a) b) c) d)	clic load test is performed to dete Ultimate load capacity under rep Skin resistance and base resista Skin resistance Tip resistance	ermine etition Ince s	e a pile's n separately	
11)	The a) c)	efficiency of pile group depends soil type pile spacing	on b) d)	 method of pile installation all of these	
12)	Geo a) c)	pphysical surveys are not useful fo large areas Underground cavities	or b) d)	 Complex boundary layers locating water tables	
13)	Duri loss a) c)	ing the process of well sinking, in in weight of the well due to buoya Kentiledge Cutting edge	order ancy, b) d)	to overcome skin friction and the term that is applied is Bed rock Steining	
14)	With a)	n increase in the size of footing the Increases	e bea b)	ring capacity of footing on clay Decreases	

- c) Remains same d) None of these

		Figure to the right indicates full marks.	
		Section – I	
Q.2	a) b)	Discuss the major criteria to be satisfied in the design of foundation? A footing 2.25 m square is located at a depth of 1.5 m in a sand of unit weight 18 kN/m ³ . The shear strength parameters are c= 0, \emptyset = 36°. Calculate the safe load carried by the footing against complete shear failure. FOS against shear failure is 3. Use Terzaghi's analysis. N _c = 65.4, N _q = 49.4, N _Y = 54	04 05
Q.3	a) b)	Discuss the limitation of plate load test. Explain in which situation raft foundation is needed? What are the IS Code provision for it?	05 04
Q.4	a) b)	A footing 3 m x 2 m in plan transmits a pressure of 130 kN /m ² on a cohesive soil having E = 6 x 10 ⁴ kN /m and μ = 0.50. Determine the immediate settlement of the footing at the centre. Write note on standard penetration test?	05 04
Q.5	Wri a) b) c) d)	i te note (Any Two) Foundation techniques in B.C.soil Types of samplers IS code method of bearing capacity Settlement in raft foundation	10
		Section – II	
Q.6	a) b)	Explain types of piles with neat sketch. A group of 9 piles with 3 piles in row were driven into soft clay extending from ground level up to a great depth. The dia and the length of piles were 25 cm and 10 m respectively. The unconfined compressive strength of the clay is 120 kPa. If the piles are placed at 100 cm c/c, compute the allowable load on the pile group. Take factor of safety = 2.5 For \emptyset = 0, Nc = 9. Take adhesion factor as 0.75.	04 05
Q.7	a)	Draw a neat sketch of a typical arrangement of a hammer foundation with a frame.	05
	b)	Discuss the construction process of Box caisson.	04
Q.8	a) b)	Discuss vibration isolation of machine foundation. Draw the sketch of block foundation with all 6 degrees of freedom. (3 translations and 3 rotations).	04 05

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No 5 & Q. No. 9 are compulsory. 2) Solve any two questions from each section.

SLR-FM-69

Set Q

Max. Marks: 56

Seat

No.

Q.9 Write note on any Two.a) Methods of Shoringb) Pneumatic caisson

- c) Vibration absorbers
- d) Criteria for satisfaction performance of machine foundation

No. B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS** Day & Date: Tuesday, 17-12-2019 Max. Marks: 70 Time: 02:30 PM To 05:30 PM Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book. 2) Make suitable assumption, if necessary and mention it clearly. 3) Figures to the right indicate full marks.

Use of electronic calculator and relevant I.S codes are allowed.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options. Geophysical surveys are not useful for _ 1)

- Complex boundary layers a) large areas b) c) Underground cavities d) locating water tables
- 2) During the process of well sinking, in order to overcome skin friction and loss in weight of the well due to buoyancy, the term that is applied is . Bed rock b)
 - a) Kentiledge

Seat

Duration: 30 Minutes

- Cutting edge d) Steining C)
- With increase in the size of footing the bearing capacity of footing on clay _____. 3) Decreases
 - Increases b) a) d)
 - c) Remains same
- 4) Bored piles are _____ pilles.
 - Large displacement a)
 - Small displacement c)
- b) Non displacement None of the above d)

None of these

Resonance in machine foundation occurs when frequency ratio is . 5)

- 7ero less than 1 a) b) Equal to one
- c) Greater than 1 d)
- 6) The floating caisson is .
 - a) Open at top closed at bottom
 - Open at top and bottom both c)
- 7) In under reamed pile construction, the ratio of shaft diameter to bulb diameter is _____.
 - a) 1/1.5 1/2 b) 1/4
 - c) 1/2.5 d)
- SPT test will be stopped when. 8)
 - 10 successive blows produce no advance a)
 - 50 blows required for 150mm penetration b)
 - Both a and b c)
 - Either a or b d)

- b) closed at top open at bottom
- None of the above d)

SLR-FM-69



Marks: 14

Set

- 9) Pressure meter test is developed by
 - a) Terzaghi's b)
 - Menard c) Cassagrande d)
- The bottom plug in well foundation is usually made up of _____. 10)
 - a) Brick Masonry b) RCC
 - c) **Cement Concrete** d) Steel
- Three piles are arranged in triangular form, efficiency of this pile group by 11) Feld's rule is _____.
 - 33.33% b) 97% a)
 - 75% d) 87.5% C)
- What were the values for soil parameters used by Terzaghi for his local 12) shear failure analysis?
 - $\Phi_{\rm m} = \frac{2}{3} \tan \Phi, C_{\rm m} = \frac{2}{3} c$ $\Phi_{\rm m} = \frac{1}{2} \tan \Phi, C = \frac{1}{2} c$ a) c)

 $\Phi_{\rm m} = \frac{3}{4} \tan \Phi$, $C = \frac{3}{4} c$ b) d) none of these

Taylor

- A cyclic load test is performed to determine a pile's _____. 13)
 - Ultimate load capacity under repetition a)
 - Skin resistance and base resistance separately b)
 - c) Skin resistance
 - Tip resistance d)

a)

- The efficiency of pile group depends on 14) soil type
 - method of pile installation b)
 - pile spacing c)
- all of these d)

msu	ucti	2) Solve any two questions from each section.2) Figure to the right indicates full marks.	
		Section – I	
Q.2	a) b)	Discuss the major criteria to be satisfied in the design of foundation? A footing 2.25 m square is located at a depth of 1.5 m in a sand of unit weight 18 kN/m ³ . The shear strength parameters are c= 0, \emptyset = 36°. Calculate the safe load carried by the footing against complete shear failure. FOS against shear failure is 3. Use Terzaghi's analysis. N _c = 65.4, N _q = 49.4, N _Y = 54	04 05
Q.3	a) b)	Discuss the limitation of plate load test. Explain in which situation raft foundation is needed? What are the IS Code provision for it?	05 04
Q.4	a)	A footing 3 m x 2 m in plan transmits a pressure of 130 kN /m ² on a cohesive soil having E = 6 x 10 ⁴ kN /m and μ = 0.50. Determine the immediate settlement of the footing at the centre.	05
o =))		04
Q.5	Wr a) b) c) d)	Foundation techniques in B.C.soil Types of samplers IS code method of bearing capacity Settlement in raft foundation	10
		Section – II	
Q.6	a) b)	Explain types of piles with neat sketch. A group of 9 piles with 3 piles in row were driven into soft clay extending from ground level up to a great depth. The dia and the length of piles were 25 cm and 10 m respectively. The unconfined compressive strength of the clay is 120 kPa. If the piles are placed at 100 cm c/c, compute the allowable load on the pile group. Take factor of safety = 2.5 For \emptyset = 0, Nc = 9. Take adhesion factor as 0.75.	04 05
Q.7	a)	Draw a neat sketch of a typical arrangement of a hammer foundation with a frame.	05
	b)	Discuss the construction process of Box caisson.	04
Q.8	a) b)	Discuss vibration isolation of machine foundation. Draw the sketch of block foundation with all 6 degrees of freedom. (3 translations and 3 rotations).	04 05

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering DESIGN OF FOUNDATIONS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No 5 & Q. No. 9 are compulsory.

SLR-FM-69

Set R

Max. Marks: 56

Seat No.

Q.9 Write note on any Two.a) Methods of Shoringb) Pneumatic caisson

- c) Vibration absorbers
- d) Criteria for satisfaction performance of machine foundation

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

DESIGN OF FOUNDATIONS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Make suitable assumption, if necessary and mention it clearly.
- 3) Figures to the right indicate full marks.
- Use of electronic calculator and relevant I.S codes are allowed.

b)

MCQ/Objective Type Questions

Duration: 30 Minutes

c)

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 1) The floating caisson is _____.
 - Open at top closed at bottom a)
 - closed at top open at bottom Open at top and bottom both d) None of the above
- 2) In under reamed pile construction, the ratio of shaft diameter to bulb diameter is _____.
 - a) 1/1.5 b) $\frac{1}{2}$ c) 1/2.5 d) 1/4
- SPT test will be stopped when. 3)
 - 10 successive blows produce no advance a)
 - 50 blows required for 150mm penetration b)
 - Both a and b c)
 - d) Either a or b
- 4) Pressure meter test is developed by _
 - Terzaghi's b) Taylor a)
 - Cassagrande d) Menard c)
- The bottom plug in well foundation is usually made up of _____. 5)
 - Brick Masonry RCC a) b)
 - c) Cement Concrete d) Steel
- Three piles are arranged in triangular form, efficiency of this pile group by 6) Feld's rule is .
 - 33.33% b) 97% a) c)
 - 75% d) 87.5%
- What were the values for soil parameters used by Terzaghi for his local 7) shear failure analysis?
 - a) $\Phi_{m} = \frac{2}{3} \tan \Phi$, $C_{m} = \frac{2}{3} c$ c) $\Phi_{m} = \frac{1}{2} \tan \Phi$, $C = \frac{1}{2} c$
- $\Phi_{\rm m} = \frac{3}{4} \tan \Phi$, $C = \frac{3}{4} c$ b)
- d) none of these

Marks: 14

14



Max. Marks: 70

			Set S
8)	 A cyclic load test is performed to deter a) Ultimate load capacity under rep b) Skin resistance and base resistance c) Skin resistance d) Tip resistance 	rmine a etition nce sep	a pile's parately
9)	The efficiency of pile group depends (on	
	a) soil type	b) m	nethod of pile installation
	c) pile spacing	d) a	Il of these
10)	Geophysical surveys are not useful fo	r	
	a) large areas	b) C	Complex boundary layers
	c) Underground cavities	d) lo	ocating water tables
11)	During the process of well sinking, in	order to	o overcome skin friction and
	loss in weight of the well due to buoya	ancy, th	ne term that is applied is
	a) Kentiledge	b) B	Bed rock
	c) Cutting edge	d) S	Steining
12)	With increase in the size of footing the	e bearir	ng capacity of footing on clay
	a) Increases	b) D	Decreases
	c) Remains same	d) N	Ione of these
13)	Bored piles are pilles. a) Large displacement c) Small displacement	b) N d) N	Ion displacement Ione of the above
14)	Resonance in machine foundation oc	curs wł	nen frequency ratio is

- a) Zero
- c) Greater than 1

- b) less than 1
- d) Equal to one

	allowable load on the pile group. Take factor of safety = 2.5 For \emptyset = 0, Nc = 9. Take adhesion factor as 0.75.	
a) b)	Draw a neat sketch of a typical arrangement of a hammer foundation with a frame. Discuss the construction process of Box caisson.	05 04
a) b)	Discuss vibration isolation of machine foundation. Draw the sketch of block foundation with all 6 degrees of freedom. (3 translations and 3 rotations).	04 05

Section – I Q.2 Discuss the major criteria to be satisfied in the design of foundation? 04 a) A footing 2.25 m square is located at a depth of 1.5 m in a sand of unit 05 b) weight 18 kN/m³. The shear strength parameters are c = 0, $\phi = 36^{\circ}$. Calculate the safe load carried by the footing against complete shear failure. FOS against shear failure is 3. Use Terzaghi's analysis. N_c= 65.4, N_g= 49.4, N_y= 54 Q.3 Discuss the limitation of plate load test. 05 a) Explain in which situation raft foundation is needed? What are the IS Code 04 b) provision for it? A footing 3 m x 2 m in plan transmits a pressure of 130 kN $/m^2$ on a 05 Q.4 a) cohesive soil having E = 6 x 10^4 kN /m and μ = 0.50. Determine the immediate settlement of the footing at the centre. **b)** Write note on standard penetration test? 04 Q.5 Write note (Any Two) 10 a) Foundation techniques in B.C.soil Types of samplers b) c) IS code method of bearing capacity

Section – II

A group of 9 piles with 3 piles in row were driven into soft clay extending

clay is 120 kPa. If the piles are placed at 100 cm c/c, compute the

from ground level up to a great depth. The dia and the length of piles were 25 cm and 10 m respectively. The unconfined compressive strength of the

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019		
Civil Engineering		
DESIGN OF FOUNDATIONS		
te: Tuesday. 17-12-2019	Max. Marks: 56	

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No 5 & Q. No. 9 are compulsory.

d) Settlement in raft foundation

Explain types of piles with neat sketch.

- - 2) Solve any two questions from each section.
 - 2) Figure to the right indicates full marks.

SLR-FM-69

Seat No.

Q.6

Q.7

Q.8

a)

b)

a)

a) b)



04 05

Page 15 of 16

Q.9 Write note on any Two.a) Methods of Shoringb) Pneumatic caisson

- c) Vibration absorbers
- d) Criteria for satisfaction performance of machine foundation
| a) 65
c) 75 | b)
d) | 35
None of these |
|---|---------------|---|
| The floor of the underground water to | ank d | esigned for pressure for |
| a) Uplift
c) Earth | b)
d) | Water
All of these |
| Thickened part of a flat slab over its known as | suppo | orting column, is technically |
| a) drop panelc) column head | b)
d) | capital none of these |
| According to I.S.: 456, 2000 the thicl
on piles at its edges, is kept not less | kness
than | of reinforced concrete footing |
| a) 20 cm
c) 40 cm | b)
d) | 30 cm
50 cm |
| A raft foundation is provided if its are building | ea exc | eeds the plan area of the |
| a) 10%
c) 30% | b)
d) | 20%
50% |
| The tanks situated underground, the designed for | walls | of the tanks are to be generally |
| a) Earth pressure onlyc) both a and b | b)
d) | Water pressure only
None of above |
| In water tank, for Fe_{250} the permissible near the water face is | ole ter | sile stress in the reinforcement |
| a) 125 N/mm² c) 115 N/mm² | b)
d) | 150N/mm ²
145 N/mm ² |
| | | |

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

- 2) Use of IS 456 and IS 3370 is not allowed.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Q.1 Choose the correct alternatives from the options.

- In an interior span of a flat slab, the negative design moment is % 1) of the total design moment
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)

SLR-FM-70

Set

Ρ

ADVANCED DESIGN OF CONCRETE STRUCTURES

Max. Marks: 70

Marks: 14

Set

- 8) Effective span of a deep beam is taken as _____
 - a) centre to centre distance between the support or 1.15 time clear span whichever is smaller
 - b) centre to centre distance between the support or 1.15 time clear span whichever is greater
 - c) centre to centre distance between the support or 1.2 time clear span whichever is smaller
 - d) centre to centre distance between the support or 1.25 time clear span whichever is smaller

b)

- 9) Piles are usually driven by _____
 - a) Diesel operated hammer b) Drop hammer
 - c) Single acting steam hammer d) All the above
- 10) In water tank, for Fe₅₀₀ the permissible tensile stress in the reinforcement near the water face is _____.
 - a) 125N/mm²
 - c) 205 N/mm² d) 190N/mm²
- 11) The diameter of the column head support a flat slab, is generally kept
 - a) 0.25 times the diameter of the column
 - b) 4.0 cm larger than the diameter of the column
 - c) 0.25 times the span length

a) one-fourth of its width

- d) none of these
- 12) A foundation is called shallow if its depth, is _____.
 - b) three-fourth of its width

130N/mm²

- c) half of its width d) equal to its width
- 13) The minimum thickness of a flat slab is taken _____.
 - a) L/32 for end panels without drops
 - b) L /36 for interior panels without drop
 - c) L /36 for end panels without drops
 - d) All the above
- 14) A simply supported beam shall be deemed as deep beam when the ratio effective span to overall depth is less than, _____
 - a) 2 b) 4
 - c) 6 d) 8

Set |

Max. Marks: 56

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Answer any two questions from each section.

- 2) Use of IS 456 and IS 3370 part IV are allowed.
- 3) Assume suitable data if necessary.
- 4) Draw neat sketches wherever necessary.
- 5) Figures to the right indicate full marks.

Section – I

- Q.2 Design a combined R.C footing for two columns A and B located 3.5 m apart. The size of column are 400 mm x 400 mm and 500 mm x 500 mm. The loads acting on the columns are 1000 kN and 1200 kN respectively. The maximum length of the footing is restricted to 6m only. The safe bearing capacity of soil may be taken as 250kN/m². Use M₂₅ grade of concrete and Fe₄₁₅ steel.
- Q.3 An R.C column 450 mm x 450 mm carrying a load of 800 kN is supported on three piles 450 mm x 450 mm in section. The centre to centre distance between the pile is 1.8 m. Design a suitable pile cap. Use M₂₀ grade of concrete and Fe₅₀₀ steel.
- Q.4 A circular slab of diameter 6 m subjected to a super imposed load of 4 N/m². It may considered as simply supported. Design the slab. Assume Poisson's ratio is zero. Use M₂₀ grade of concrete and Fe₄₁₅ steel.

Section – II

- Q.5 Design a circular ESR by assuming top slab simply supported at edges, vertical walls top free and bottom fixed. Bottom slab is supported by beams resting on four peripheral columns. The capacity of ESR is 50,000 litres. Use IS code method for design. The depth of water may be kept as 3.2 m with free board 0.3 m. Use M₂₅ grade of concrete and Fe₅₀₀ Steel.
- **Q.6** Design an underground water tank 3 m x 8 m x 3 m deep. The subsoil consists of sand having angle of repose of 30^{0} and saturated unit weight of 16 kN/m³. The water table can rise up to ground level. Use M₂₅ grade of concrete and Fe₄₁₅ Steel. Take unit weight of water as 9.8 kN/m³. Live load on roof slab is 2 kN/m².
- Q.7 A simply supported deep beam is 250 mm wide, 3500 mm deep and has clear span 4.2 m. The beam carries superimposed load of 225 kN/m. The beam has bearing of 450 mm at each end. Design the beam with M₂₀grade of concrete and Fe₄₁₅ Steel.

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of IS 456 and IS 3370 is not allowed.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- Effective span of a deep beam is taken as ____
 - a) centre to centre distance between the support or 1.15 time clear span whichever is smaller
 - b) centre to centre distance between the support or 1.15 time clear span whichever is greater
 - c) centre to centre distance between the support or 1.2 time clear span whichever is smaller
 - d) centre to centre distance between the support or 1.25 time clear span whichever is smaller
- 2) Piles are usually driven by _____.
 - a) Diesel operated hammer b) Drop hammer
 - c) Single acting steam hammer d) All the above
- 3) In water tank, for Fe_{500} the permissible tensile stress in the reinforcement near the water face is _____.
 - a) 125N/mm² b) 130N/mm²
 - c) 205 N/mm² d) 190N/mm²
- 4) The diameter of the column head support a flat slab, is generally kept
 - a) 0.25 times the diameter of the column
 - b) 4.0 cm larger than the diameter of the column
 - c) 0.25 times the span length
 - d) none of these
- 5) A foundation is called shallow if its depth, is _____
 - a) one-fourth of its widthb) three-fourth of its widthc) half of its widthd) equal to its width
 - c) half of its widthd) equal to its widthThe minimum thickness of a flat slab is taken
 - a) L/32 for end panels without drops
 - b) L /36 for interior panels without drop
 - c) L /36 for end panels without drops
 - d) All the above

6)

Max. Marks: 70

Marks: 14

			Set			
7)	A simply supported beam shall be defined a simply supported beam shall be defined as the second seco	eeme s thar	d as deep beam when the ratio			
	a) 2	b)	4			
	C) 6	a)	8			
8)	In an interior span of a flat slab, the of the total design moment.	negat	ive design moment is %			
	a) 65	b)	35			
	c) 75	d)	None of these			
9)	The floor of the underground water t the empty tank condition.	ank d	esigned for pressure for			
	a) Uplift	b)	Water			
	c) Earth	d)	All of these			
10)	Thickened part of a flat slab over its known as	supp	orting column, is technically			
	a) drop panel	b)	capital			
	c) column head	d)	none of these			
11)	According to I.S.: 456, 2000 the thic on piles at its edges, is kept not less	kness than	of reinforced concrete footing			
	a) 20 cm	b)	30 cm			
	c) 40 cm	d)	50 cm			
12)	A raft foundation is provided if its are building	ea exo	ceeds the plan area of the			
	a) 10%	b)	20%			
	c) 30%	d)	50%			
13)	The tanks situated underground, the designed for	walls	s of the tanks are to be generally			
	a) Earth pressure only	b)	Water pressure only			
	c) both a and b	d)	None of above			
14)	In water tank, for Fe_{250} the permissible tensile stress in the reinforcement pear the water face is					
		L-)	4 5 0 N / Han 2			

- a) 125 N/mm² c) 115 N/mm²
- b) 150N/mm² d) 145 N/mm²

Q

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

Instructions: 1) Answer any two questions from each section.

- 2) Use of IS 456 and IS 3370 part IV are allowed.
- 3) Assume suitable data if necessary.
- 4) Draw neat sketches wherever necessary.
- 5) Figures to the right indicate full marks.

Section – I

- Q.2 Design a combined R.C footing for two columns A and B located 3.5 m apart. The size of column are 400 mm x 400 mm and 500 mm x 500 mm. The loads acting on the columns are 1000 kN and 1200 kN respectively. The maximum length of the footing is restricted to 6m only. The safe bearing capacity of soil may be taken as 250kN/m². Use M₂₅ grade of concrete and Fe₄₁₅ steel.
- Q.3 An R.C column 450 mm x 450 mm carrying a load of 800 kN is supported on three piles 450 mm x 450 mm in section. The centre to centre distance between the pile is 1.8 m. Design a suitable pile cap. Use M₂₀ grade of concrete and Fe₅₀₀ steel.
- Q.4 A circular slab of diameter 6 m subjected to a super imposed load of 4 N/m². It may considered as simply supported. Design the slab. Assume Poisson's ratio is zero. Use M₂₀ grade of concrete and Fe₄₁₅ steel.

Section – II

- Q.5 Design a circular ESR by assuming top slab simply supported at edges, vertical walls top free and bottom fixed. Bottom slab is supported by beams resting on four peripheral columns. The capacity of ESR is 50,000 litres. Use IS code method for design. The depth of water may be kept as 3.2 m with free board 0.3 m. Use M₂₅ grade of concrete and Fe₅₀₀ Steel.
- **Q.6** Design an underground water tank 3 m x 8 m x 3 m deep. The subsoil consists of sand having angle of repose of 30^{0} and saturated unit weight of 16 kN/m³. The water table can rise up to ground level. Use M₂₅ grade of concrete and Fe₄₁₅ Steel. Take unit weight of water as 9.8 kN/m³. Live load on roof slab is 2 kN/m².
- Q.7 A simply supported deep beam is 250 mm wide, 3500 mm deep and has clear span 4.2 m. The beam carries superimposed load of 225 kN/m. The beam has bearing of 450 mm at each end. Design the beam with M₂₀grade of concrete and Fe₄₁₅ Steel.

Set

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of IS 456 and IS 3370 is not allowed.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

- 1) A raft foundation is provided if its area exceeds the plan area of the building
 - a) 10% b)
 - c) 30% d) 50%
- 2) The tanks situated underground, the walls of the tanks are to be generally designed for _____.
 - a) Earth pressure only b)
 - c) both a and b d) None of above
- 3) In water tank, for Fe₂₅₀ the permissible tensile stress in the reinforcement near the water face is _____.
 - a) 125 N/mm²

b) 150N/mm²

20%

Water pressure only

- c) 115 N/mm² d) 145 N/mm²
- 4) Effective span of a deep beam is taken as ____
 - a) centre to centre distance between the support or 1.15 time clear span whichever is smaller
 - b) centre to centre distance between the support or 1.15 time clear span whichever is greater
 - c) centre to centre distance between the support or 1.2 time clear span whichever is smaller
 - d) centre to centre distance between the support or 1.25 time clear span whichever is smaller
- 5) Piles are usually driven by _____
 - a) Diesel operated hammer b) Drop hammer
 - c) Single acting steam hammer d) All the above
- 6) In water tank, for Fe₅₀₀ the permissible tensile stress in the reinforcement near the water face is _____.
 - a) 125N/mm² b) 130N/mm²
 - c) 205 N/mm² d) 190N/mm²

Marks: 14

14

Marka: 1/

SLR-FM-70

Max. Marks: 70

	Set
7)	The diameter of the column head support a flat slab, is generally kept
	 a) 0.25 times the diameter of the column b) 4.0 cm larger than the diameter of the column c) 0.25 times the span length d) none of these
8)	A foundation is called shallow if its depth, isa) one-fourth of its widthb) three-fourth of its widthc) half of its widthd) equal to its width
9)	 The minimum thickness of a flat slab is taken a) L/32 for end panels without drops b) L /36 for interior panels without drop c) L /36 for end panels without drops d) All the above
10)	A simply supported beam shall be deemed as deep beam when the ratio effective span to overall depth is less than, a) 2 b) 4 c) 6 d) 8
11)	In an interior span of a flat slab, the negative design moment is% of the total design moment. a) 65 b) 35 c) 75 d) None of these
12)	The floor of the underground water tank designed for pressure forthe empty tank condition
13)	Thickened part of a flat slab over its supporting column, is technically known as a) drop panel b) capital c) column head d) none of these
14)	According to I.S.: 456, 2000 the thickness of reinforced concrete footing on piles at its edges, is kept not less than a) 20 cm b) 30 cm

a) 20 cm b) 30 cm c) 40 cm d) 50 cm SLR-FM-70

R

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

Instructions: 1) Answer any two questions from each section.

- 2) Use of IS 456 and IS 3370 part IV are allowed.
- 3) Assume suitable data if necessary.
- 4) Draw neat sketches wherever necessary.
- 5) Figures to the right indicate full marks.

Section – I

- Q.2 Design a combined R.C footing for two columns A and B located 3.5 m apart. The size of column are 400 mm x 400 mm and 500 mm x 500 mm. The loads acting on the columns are 1000 kN and 1200 kN respectively. The maximum length of the footing is restricted to 6m only. The safe bearing capacity of soil may be taken as 250kN/m². Use M₂₅ grade of concrete and Fe₄₁₅ steel.
- Q.3 An R.C column 450 mm x 450 mm carrying a load of 800 kN is supported on three piles 450 mm x 450 mm in section. The centre to centre distance between the pile is 1.8 m. Design a suitable pile cap. Use M₂₀ grade of concrete and Fe₅₀₀ steel.
- Q.4 A circular slab of diameter 6 m subjected to a super imposed load of 4 N/m². It may considered as simply supported. Design the slab. Assume Poisson's ratio is zero. Use M₂₀ grade of concrete and Fe₄₁₅ steel.

Section – II

- Q.5 Design a circular ESR by assuming top slab simply supported at edges, vertical walls top free and bottom fixed. Bottom slab is supported by beams resting on four peripheral columns. The capacity of ESR is 50,000 litres. Use IS code method for design. The depth of water may be kept as 3.2 m with free board 0.3 m. Use M₂₅ grade of concrete and Fe₅₀₀ Steel.
- **Q.6** Design an underground water tank 3 m x 8 m x 3 m deep. The subsoil consists of sand having angle of repose of 30^{0} and saturated unit weight of 16 kN/m³. The water table can rise up to ground level. Use M₂₅ grade of concrete and Fe₄₁₅ Steel. Take unit weight of water as 9.8 kN/m³. Live load on roof slab is 2 kN/m².
- Q.7 A simply supported deep beam is 250 mm wide, 3500 mm deep and has clear span 4.2 m. The beam carries superimposed load of 225 kN/m. The beam has bearing of 450 mm at each end. Design the beam with M₂₀grade of concrete and Fe₄₁₅ Steel.

Set

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Use of IS 456 and IS 3370 is not allowed.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options. In water tank, for Fe₅₀₀ the permissible tensile stress in the reinforcement 1)
 - near the water face is _____.
 - 130N/mm² $125N/mm^2$ b) a)
 - 190N/mm² 205 N/mm^2 d) c)
 - 2) The diameter of the column head support a flat slab, is generally kept
 - a) 0.25 times the diameter of the column
 - b) 4.0 cm larger than the diameter of the column
 - c) 0.25 times the span length
 - d) none of these
 - 3) A foundation is called shallow if its depth, is three-fourth of its width
 - a) one-fourth of its width b)
 - c) half of its width equal to its width d)
 - 4) The minimum thickness of a flat slab is taken
 - a) L/32 for end panels without drops
 - b) L /36 for interior panels without drop
 - c) L/36 for end panels without drops
 - d) All the above
 - A simply supported beam shall be deemed as deep beam when the ratio 5) effective span to overall depth is less than, _
 - a) 2 b) 4
 - d) c) 6 8
 - 6) In an interior span of a flat slab, the negative design moment is _____ % of the total design moment.
 - a) 65 b) 35 c) 75 d) None of these
 - The floor of the underground water tank designed for _____ pressure for 7) the empty tank condition.

b)

Water

- a) Uplift
- c) Earth d) All of these

SLR-FM-70

Max. Marks: 70

Marks: 14

			Set
8)	Thickened part of a flat slab over its known as a) drop panel c) column head	b) b) d)	orting column, is technically capital none of these
9)	According to I.S.: 456, 2000 the thic on piles at its edges, is kept not less a) 20 cm c) 40 cm	knes: s than b) d)	s of reinforced concrete footing 30 cm 50 cm
10)	A raft foundation is provided if its ar building a) 10% c) 30%	ea ex b) d)	ceeds the plan area of the 20% 50%
11)	The tanks situated underground, the designed for a) Earth pressure only c) both a and b	e wall b) d)	s of the tanks are to be generally Water pressure only None of above
12)	In water tank, for Fe ₂₅₀ the permissinear the water face is a) 125 N/mm ² c) 115 N/mm ²	ble te b) d)	nsile stress in the reinforcement 150N/mm ² 145 N/mm ²
13)	 Effective span of a deep beam is ta a) centre to centre distance betwee whichever is smaller b) centre to centre distance betwee whichever is greater c) centre to centre distance betwee whichever is smaller 	ken a en the en the	s e support or 1.15 time clear span e support or 1.15 time clear span e support or 1.2 time clear span
	 d) centre to centre distance between the second seco	en th	e support or 1.25 time clear span

- whichever is smaller
- 14)
- Piles are usually driven by _____.a) Diesel operated hammerc) Single acting steam hammer b)
 - Drop hammer All the above d)

S

Seat	
No.	

Set S

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM Max. Marks: 56

Instructions: 1) Answer any two questions from each section.

- 2) Use of IS 456 and IS 3370 part IV are allowed.
- 3) Assume suitable data if necessary.
- 4) Draw neat sketches wherever necessary.
- 5) Figures to the right indicate full marks.

Section – I

- Q.2 Design a combined R.C footing for two columns A and B located 3.5 m apart. The size of column are 400 mm x 400 mm and 500 mm x 500 mm. The loads acting on the columns are 1000 kN and 1200 kN respectively. The maximum length of the footing is restricted to 6m only. The safe bearing capacity of soil may be taken as 250kN/m². Use M₂₅ grade of concrete and Fe₄₁₅ steel.
- Q.3 An R.C column 450 mm x 450 mm carrying a load of 800 kN is supported on three piles 450 mm x 450 mm in section. The centre to centre distance between the pile is 1.8 m. Design a suitable pile cap. Use M₂₀ grade of concrete and Fe₅₀₀ steel.
- Q.4 A circular slab of diameter 6 m subjected to a super imposed load of 4 N/m². It may considered as simply supported. Design the slab. Assume Poisson's ratio is zero. Use M₂₀ grade of concrete and Fe₄₁₅ steel.

Section – II

- Q.5 Design a circular ESR by assuming top slab simply supported at edges, vertical walls top free and bottom fixed. Bottom slab is supported by beams resting on four peripheral columns. The capacity of ESR is 50,000 litres. Use IS code method for design. The depth of water may be kept as 3.2 m with free board 0.3 m. Use M₂₅ grade of concrete and Fe₅₀₀ Steel.
- **Q.6** Design an underground water tank 3 m x 8 m x 3 m deep. The subsoil consists of sand having angle of repose of 30^{0} and saturated unit weight of 16 kN/m³. The water table can rise up to ground level. Use M₂₅ grade of concrete and Fe₄₁₅ Steel. Take unit weight of water as 9.8 kN/m³. Live load on roof slab is 2 kN/m².
- Q.7 A simply supported deep beam is 250 mm wide, 3500 mm deep and has clear span 4.2 m. The beam carries superimposed load of 225 kN/m. The beam has bearing of 450 mm at each end. Design the beam with M₂₀grade of concrete and Fe₄₁₅ Steel.

Set

Max. Marks: 70

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering** MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- Identify the INCORRECT option. 1)
 - "Measure" involves collection of data relating to quality, cost, a) throughput time etc.
 - "Analyze" uses data collected from previous step to understand b) cause-and-effect relationship and to identify sources of variability
 - "Define" imposes creative thinking to about the specific change that C) can be made in the process.
 - "Control" completes all remaining project and to hand off the improved d) process to the owner along with a process control plan.
- Six sigma implementations can be divided into three generations. Which of 2) the following option is INCORRECT?
 - a) The first generation focused on defect elimination and variability reduction
 - b) Second generation mainly focused on integrating the above with improved business performance through cost reduction.
 - Third generation is marked by focus on creating value throughout the c) organization and for its stakeholders.
 - d) All options are FALSE
- 3) Improving quality through small, incremental improvements is a characteristic of what type of quality management system?
 - Just-in-time Six Sigma a) b)
 - **Total Quality Management** Kaizen d) c)
- 4) The following is (are) the type(s) of flow process chart: Man type, Material type, Equipment type. The correct answer is:
 - All of these a)

c)

- Material and Equipment type b) Only man type
- Man and Material type d)
- Work study is most useful in 5)
 - improving industrial relations a)
 - Where production activities are involved b)
 - In judging the rating of machines c)
 - In judging the output of a man and improving it d)

Marks: 14

				SLR-FM-71
				Set P
6)	Wor a) c)	k study is also recognized as Both Time and motion study Motion study	b) d)	None of these Time study
7)	In pr	rocess charts, the symbol used fo	or sto	rage is
	a)	Square	b)	Triangle
	c)	Arrow	d)	Circle
8)	In pr	ocess charts, the symbol used for	or ins	pection is
	a)	Circle	b)	Arrow
	c)	Square	d)	Triangle
9)	The	correct order of procedure in me	ethod :	study is
	a)	Select - Record - Examine - De	velop	- Define - Install - Maintain
	b)	Select - Record - Examine - De	fine -	Develop - Install - Maintain
	c)	Select - Define - Examine - Dev	velop	- Record - Install - Maintain
	d)	Select - Record - Develop - Exa	amine	- Define - Install - Maintain
10)	Anal	lysis of Therbligs is most closely	relate	ed to
	a)	all of these	b)	motion study
	c)	methods analysis	d)	work sampling
11)	A a) c)	is based on film analysis. Operation flow chart String diagram	b) d)	Outline process chart SIMO chart
12)	In Sl	IMO chart, the movements are re	ecorde	ed against time measured in
	a)	Winks	b)	Micro seconds
	c)	Seconds	d)	Minutes
13)	Fund	ctional analysis is step of	value	engineering job plan.
	a)	I	b)	II
	c)	III	d)	IV
14)	Aest	thetic aspects of the product are	majoi	rly related to

Use value a)

Esteem value

c) Cost value

- b) d) Exchange value

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- Q.2 a) Explain advantages of Work study?
 - b) State and explain the eight steps or procedures in Method study.
- a) In a welding shop, a direct time study was done on a welding operation. Q.3 One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- a) Write a short note on Failure mode and effects analysis (FMEA). 04 Q.8 b) Discuss types of failures in reliability analysis. 04

Max. Marks: 56

06 06

SLR-FM-71

Set

Seat No.

04

- **Q.9 a)** Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

Seat								Set	Q
110.		B.E.	. (Part - I)	(New) (CE	BCS) Ex	ami	ination Nov/Dec-20	019	
				Civi	I Engin	eeri	ng		
				MANAGE	RIAL TE	ECH	NIQUES		
Day & Time:	& Date : 02:30	e: Tue 0 PM	esday, 17-12 To 05:30 P	2-2019 M			I	Max. Marks	: 70
Instru	uctior	าร: 1)	Q. No. 1 is Book.	compulsory	and sho	uld b	e solved in first 30 min	utes in ansv	ver
		2)	Figures to	the right ind	icate full i	mark	S.		
Durot	ion: 2	O Min	utoo	MCQ/Obje	ctive Typ	be Q	uestions	Morke	. 11
Durai	ion: 3		ules		6 1		• • • •	Marks	; 14
Q.1	Choc 1)	n nr וח חו	ocess chart	s the symbol	trom the	e opt or ins	ions. pection is		14
	')	a) c)	Circle Square			b) d)	Arrow Triangle		
	2)	The a) b) c) d)	correct orde Select - Re Select - Re Select - De Select - Re	er of procedu ecord - Exan ecord - Exan efine - Exam ecord - Deve	ure in met nine - Dev nine - Def ine - Dev elop - Exa	hod /elop ine - elop mine	study is - Define - Install - Maiı Develop - Install - Maiı - Record - Install - Maiı - Define - Install - Maiı	ntain ntain ntain ntain	
	3)	Analy a) c)	ysis of Ther all of these methods a	bligs is mos nalysis	t closely ı	relate b) d)	ed to motion study work sampling		
	4)	A a) c)	is base Operation String diag	d on film an flow chart ram	alysis.	b) d)	Outline process chart SIMO chart		
	5)	In SI a) c)	MO chart, tl Winks Seconds	he movemer	nts are re	cord b) d)	ed against time measu Micro seconds Minutes	red in	_ .
	6)	Func a) c)	tional analy I III	/sis is	_ step of v	/alue b) d)	engineering job plan. II IV		
	7)	Aest a) c)	hetic aspec Use value Cost value	ts of the pro	duct are r	najo b) d)	rly related to Esteem value Exchange value		
	8)	ldent a)	tify the INC("Measure" i throughput	ORRECT op nvolves colle time etc.	otion. ection of o	data	relating to quality, cost	,	
		b)	"Analyze" u cause-and-	ses data col effect relatio	lected fro	om pr d to i	evious step to understa dentify sources of varia	and Ibility	
		C)	"Define" im can be mad	poses creati le in the pro	ve thinkin cess.	ig to	about the specific char	nge that	
		d)	"Control" co	ompletes all the owner al	remaining ong with	g pro a pro	ject and to hand off the ocess control plan.	improved	

SLR-FM-71

- 9) Six sigma implementations can be divided into three generations. Which of the following option is INCORRECT?
 - The first generation focused on defect elimination and variability a) reduction
 - Second generation mainly focused on integrating the above with b) improved business performance through cost reduction.
 - Third generation is marked by focus on creating value throughout the c) organization and for its stakeholders.
 - All options are FALSE d)
- Improving quality through small, incremental improvements is a 10) characteristic of what type of quality management system?
 - a) Just-in-time b) Six Sigma
 - c) Kaizen d) **Total Quality Management**
- 11) The following is (are) the type(s) of flow process chart: Man type, Material type, Equipment type. The correct answer is: _____
 - a) All of these
- Material and Equipment type b) Only man type

Set

- Man and Material type C)
 - d)
- 12) Work study is most useful in _
 - improving industrial relations a)
 - Where production activities are involved b)
 - In judging the rating of machines c)
 - In judging the output of a man and improving it d)
- Work study is also recognized as 13)
 - Both Time and motion study b) None of these a)
 - c) Motion study d) Time study
- 14) In process charts, the symbol used for storage is
 - Square a) Arrow C)

- Triangle b)
- Circle d)

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- Q.2 a) Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 Discuss types of failures in reliability analysis.
 O4

SLR-FM-71

Max. Marks: 56



06

- **Q.9 a)** Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

Seat No.								Set	R	
		B.E.	(Part - I)	(New) (C	BCS) E	xam	ination Nov/Dec-20	019		
	Civil Engineering									
Day 8	R Date	e. Tue	sdav 17-1	WANAGE 2-2019	RIAL I	ECH	NIQUES	Max Marks	· 70	
Time:	02:3	0 PM	To 05:30 P	M						
Instru	uctio	ns: 1)	Q. No. 1 is Book.	compulsory	/ and sho	ould b	e solved in first 30 min	utes in ans	wer	
	2) Figures to the right indicate full marks.									
Durat	MCQ/Objective Type Questions Duration: 30 Minutes Marks: 14									
Q.1	Choo	ose th	e correct a	alternatives	from th	e opt	ions.		14	
	1)	Work a) i	study is m moroving i	ost useful ir ndustrial rel	n ations					
		b) \	Where proc	duction activ	rities are	involv	ved			
		c) I d) I	n judging t n judging t	he rating of he output of	machine [:] a man a	s .nd im	provina it			
	2)	Work	study is al	so recogniz	ed as					
	-	a) c)	Both Time Motion stu	and motion dy	study	b) d)	None of these Time study			
	3)	In pro a)	ocess chart Square	s, the symb	ol used f	or sto b)	rage is Triangle			
	1)	C) /	Arrow	a tha avmb	ol upod f	a) or ino				
	4)	a)	Circle	.s, the symb		b)	Arrow			
		c)	Square			d)	Triangle			
	5)	The c a) b) c)	correct orde Select - Re Select - Re Select - De	er of proced ecord - Exar ecord - Exar efine - Exar	ure in me nine - De nine - De nine - De	ethod evelop efine - velop	study is - Define - Install - Mai Develop - Install - Mai - Record - Install - Mai	ntain ntain ntain		
	d) Select - Record - Develop - Examine - Define - Install - Maintain									
	6)	Analy a) c)	vsis of Thei all of these methods a	bligs is mos a nalysis	st closely	relate b) d)	ed to motion study work sampling			
	7)	A a)	is base Operation	ed on film ar flow chart	alysis.	b)	Outline process chart			
		c)	String diag	Iram		d)	SIMO chart			
	8)	In SII a) c)	VO chart, t Winks Seconds	he moveme	nts are re	ecord b) d)	ed against time measu Micro seconds Minutes	red in	•	
	9)	Func	tional analy	/sis is	_ step of	value	engineering job plan.			
		a) c)	 			b) d)	ll IV			

- SLR-FM-71 Set R
- 10) Aesthetic aspects of the product are majorly related to _____.
 - a) Use value

b) Esteem value

c) Cost value

- d) Exchange value
- 11) Identify the INCORRECT option.
 - a) "Measure" involves collection of data relating to quality, cost, throughput time etc.
 - b) "Analyze" uses data collected from previous step to understand cause-and-effect relationship and to identify sources of variability
 - c) "Define" imposes creative thinking to about the specific change that can be made in the process.
 - d) "Control" completes all remaining project and to hand off the improved process to the owner along with a process control plan.
- 12) Six sigma implementations can be divided into three generations. Which of the following option is INCORRECT?
 - a) The first generation focused on defect elimination and variability reduction
 - b) Second generation mainly focused on integrating the above with improved business performance through cost reduction.
 - c) Third generation is marked by focus on creating value throughout the organization and for its stakeholders.
 - d) All options are FALSE
- 13) Improving quality through small, incremental improvements is a characteristic of what type of quality management system?
 - a) Just-in-timeb) Six Sigmac) Kaizend) Total Qual
 - d) Total Quality Management
- 14) The following is (are) the type(s) of flow process chart: Man type, Material type, Equipment type. The correct answer is: _____.
 - a) All of these

- b) Material and Equipment type
- c) Man and Material type
- d) Only man type

Seat No.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- **Q.2 a)** Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 b) Discuss types of failures in reliability analysis.
 04
 04

Max. Marks: 56

06 06

SLR-FM-71

Set

R

- **Q.9 a)** Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

Seat No.								Set	S
		B.E	. (Part - I)	(New) (CB	CS) E>	cami	nation Nov/Dec-2019	L	
Day & Time:	Date 02:30	e: Tue 0 PM	esday, 17-1 To 05:30 F	2-2019 PM		_011	Max	. Marks	: 70
Instru	iction	ns: 1)	Q. No. 1 is Book.	s compulsory a	and sho	uld be	e solved in first 30 minutes	in ansv	ver
		2)) Figures to	the right indic	cate full	mark	S.		
Durati	ion: 3	0 Mir	nutes	MCQ/Objec	tive Typ	pe Qi	uestions	Marks	: 14
Q.1	Choo	ose th	ne correct a	alternatives f	rom the	e opti	ons.		14
	1)	Anal a) c)	ysis of The all of these methods a	rbligs is most e analysis	closely	relate b) d)	ed to motion study work sampling		
:	2)	A a) c)	is base Operation String diag	ed on film ana flow chart gram	lysis.	b) d)	Outline process chart SIMO chart		
;	3)	In SI a) c)	MO chart, f Winks Seconds	the movement	ts are re	corde b) d)	ed against time measured i Micro seconds Minutes	n	_•
	4)	Func a) c)	ctional anal <u>y</u> I III	ysis is	step of v	/alue b) d)	engineering job plan. II IV		
:	5)	Aest a) c)	hetic aspec Use value Cost value	ets of the prod	uct are i	major b) d)	ly related to Esteem value Exchange value		
	6)	lden a) b) c) d)	tify the INC "Measure" throughput "Analyze" u cause-and "Define" im can be mad "Control" co process to	ORRECT opti involves colle time etc. uses data colle effect relation poses creativ de in the proce ompletes all re the owner alo	ion. ction of ected fro ship and e thinkir ess. emaining ong with	data om pro d to io ng to a g proj a pro	relating to quality, cost, evious step to understand dentify sources of variability about the specific change t ect and to hand off the imp cess control plan.	/ hat vroved	
	7)	Six s the f a) b) c) d)	sigma imple ollowing op The first ge reduction Second ge improved b Third gene organizatio All options	ementations ca ation is INCOR eneration focu neration main pusiness perfo ration is mark on and for its s are FALSE	an be div RECT? sed on o ly focuse ormance ed by fo stakeholo	vided defec ed on throu cus c ders.	into three generations. Wh t elimination and variability n integrating the above with ugh cost reduction. on creating value throughou	iich of it the	

Set S

SLR-FM-71

- 8) Improving quality through small, incremental improvements is a characteristic of what type of quality management system? Just-in-time Six Sigma a) b) C) Kaizen d) Total Quality Management The following is (are) the type(s) of flow process chart: Man type, Material 9) type, Equipment type. The correct answer is: _____ All of these Material and Equipment type a) b) Man and Material type d) Only man type C) 10) Work study is most useful in ____ improving industrial relations a) Where production activities are involved b) In judging the rating of machines c) In judging the output of a man and improving it d) 11) Work study is also recognized as Both Time and motion study b) None of these a) c) Motion study d) Time study 12) In process charts, the symbol used for storage is ___. Square b) Triangle a) Arrow Circle c) d) 13) In process charts, the symbol used for inspection is _____. Circle Arrow a) b) C) Square d) Triangle
- 14) The correct order of procedure in method study is _____
 - a) Select Record Examine Develop Define Install Maintain
 - b) Select Record Examine Define Develop Install Maintain
 - c) Select Define Examine Develop Record Install Maintain
 - d) Select Record Develop Examine Define Install Maintain



Seat No.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- **Q.2 a)** Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 b) Discuss types of failures in reliability analysis.
 04
 04

Max. Marks: 56

Set

06 06

SLR-FM-71

- **Q.9 a)** Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering

ENTREPRENEURSHIP

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

b)

d)

d)

Business

None of these

Technical risk

Q.1 Choose the correct alternatives from the options.

- 1) An enterprise is a company or business _
 - a) Company

Duration: 30 Minutes

- c) Either a or b
- The activity of setting up a business or businesses, taking on _____ in the hope of profit.
- a) Financial risk b) Loss
 - c) Profit
- 3) Venture capital is concerned with:
 - a) New project having potential for higher profit
 - b) New project of high technology
 - c) New project having high risk
 - d) All the above
- 4) A women entrepreneur is supposed to have a minimum financial interest in share capital of entrepreneur's enterprise _____.
 - a) 35 per cent b) 51 per cent
 - c) 25 per cent d) None of the above
- 5) EDP (Entrepreneurship Development Programmes) is required to help
 - a) Existing entrepreneurs
 - b) First generation entrepreneurs
 - c) Future generations entrepreneurs
 - d) None of the above
- A Micro Enterprise is an enterprise where investment in plant and machinery does not exceed (According to MSMED Act, 2006) _____
 - a) Rs. 15 Lakh b) Rs. 20 Lakh
 - c) Rs. 25 Lakh d) Rs. 30 Lakh
- Why should an entrepreneur do a feasibility study for starting a new venture _____.
 - a) To identify possible sources of funds
 - b) To see if there are possible barriers to success
 - c) To estimate the expected sales
 - d) To explore potential customers

SLR-FM-74

Set

Max. Marks: 70

Marks: 14

14

Mark

- 8) Individuals influencing an entrepreneur's career choice and style are known as which of the following?
 - a) Moral-support network

c)

c)

c)

- Role model b) Professional support network d) Support system
- 9) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
 - a) New business model b)
 - c) None of the given options d) Creative destruction
- 10) Having less than 50 percent of equity share in an international venture is called
 - Joint Venture a)

Minority interest

- b) Majority interest Exporting d)
- What is the process by which individuals pursue opportunities without regard 11) to resources they currently control?
 - a) Startup management
 - b) Entrepreneurship c) Financial analysis d) Feasibility planning
- A person who managed large project was termed as the entrepreneur in 12) the _
 - a) Earliest period
 - c) 17th century

- b) Middle ages
- 19th and 20th century d)
- 13) The entrepreneur was distinguished from capital provider in .
 - a) Middle ages 18th century

- 17th century b) d) 19th and 20th century
- Which of the following is used by entrepreneurs to acquire experience in 14) an international market before making a major commitment?
 - a) Merger

b) **Minority Interest**

Joint venture c)

d) Majority interest

Anatomization

Set



Seat No.					Set	Ρ	
		B.E. (Part – I)	(New) (CBCS) Civil Engi ENTREPREI	Examination Nov/De neering NEURSHIP	c-2019		
Day 8 Time:	& Date 02:3	e: Tuesday, 17-12 0 PM To 05:30 P	2-2019 M		Max. Marks	s: 56	
Instru	uctio	ns: 1) Q. No. 2 & 2) Solve any 1 3) Figures to 4) Draw neat 5) Use of non	Q. No. 6 are comp wo questions from he right indicate fu sketches wherever programmable cal	ulsory. each section. Il marks. necessary. culator is permitted.			
			Sectio	n – I			
Q.2	Expl a)	l ain the following risks involved wit	j: h entrepreneurship	,		12	
	b) c)	barriers to Entrep Factors affecting	oreneurship entrepreneurial gro	owth.			
03	, Writ	e Notes	1 3			08	
4.0	a) b)	qualities of a successful entrepreneur types of entrepreneurs					
Q.4	Expl a) b)	xplain the following concepts. 08 Role of Government in promoting Entrepreneurship 08 entrepreneurial competencies 08					
Q.5	Writ a)	Write detailed notes. 08 a) Women Entrepreneurship Problems of Women Entrepreneurship in India					
	b)	remedies to solv	e the problems of v	omen entrepreneurs			
			Sectio	n – II			
Q.6	a) b)	Estimation of cos 1) break even a 2) cash flow ch 3) financial stat	t of project and me inalysis arts ements	eans of financing		12	
Q.7	Writ a) b)	Vrite Notes. 08) Long term and Short term financial support) Preparation of Business Plans					
Q.8	Expl a) b)	l ain in brief. working capital a Preliminary and f	nd fixed capital ass inal project report (sessment preparation		08	
Q.9	Writ a) b)	e Notes. Industrial and co Communication s	mmercial tax laws skills development	and barriers		08	

SLR-FM-74 Set P

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

Civil Engineering ENTREPRENEURSHIP

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options.

- Individuals influencing an entrepreneur's career choice and style are 1) known as which of the following? Role model
 - a) Moral-support network
 - b) c) Professional support network d) Support system
- 2) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?

b)

d)

b)

Anatomization

Creative destruction

- a) New business model
- None of the given options c)
- 3) Having less than 50 percent of equity share in an international venture is called
 - Joint Venture a)
 - Majority interest Exporting Minority interest d) C)
- What is the process by which individuals pursue opportunities without regard 4) to resources they currently control?
 - a) Startup management
 - b) Entrepreneurship c) Financial analysis d) Feasibility planning
- 5) A person who managed large project was termed as the entrepreneur in the
 - a) Earliest period Middle ages b)
 - c) 17th century d) 19th and 20th century
- 6) The entrepreneur was distinguished from capital provider in .
 - Middle ages 17th century a) b) 18th century 19th and 20th century d) C)
- Which of the following is used by entrepreneurs to acquire experience in 7) an international market before making a major commitment?
 - **Minority Interest** a) Merger b)
 - Joint venture Majority interest d) C)
- An enterprise is a company or business 8)
 - a) Company Either a or b c)

- **Business** b)
- None of these d)

Max. Marks: 70

SLR-FM-74



9) The activity of setting up a business or businesses, taking on _____ in the hope of profit.

a) Financial riskc) Profit

- b) Loss
- d) Technical risk

SLR-FM-74

Set Q

- 10) Venture capital is concerned with:
 - a) New project having potential for higher profit
 - b) New project of high technology
 - c) New project having high risk
 - d) All the above
- 11) A women entrepreneur is supposed to have a minimum financial interest in share capital of entrepreneur's enterprise _____.
 - a) 35 per cent b) 51 per cent
 - c) 25 per cent d) None of the above
- 12) EDP (Entrepreneurship Development Programmes) is required to help
 - a) Existing entrepreneurs
 - b) First generation entrepreneurs
 - c) Future generations entrepreneurs
 - d) None of the above
- A Micro Enterprise is an enterprise where investment in plant and machinery does not exceed (According to MSMED Act, 2006) _____.
 - a) Rs. 15 Lakh b) Rs. 20 Lakh
 - c) Rs. 25 Lakh d) Rs. 30 Lakh
- 14) Why should an entrepreneur do a feasibility study for starting a new venture _____.
 - a) To identify possible sources of funds
 - b) To see if there are possible barriers to success
 - c) To estimate the expected sales
 - d) To explore potential customers

		B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-20 Civil Engineering ENTREPRENEURSHIP	19				
Day & Time	& Dat : 02:3	e: Tuesday, 17-12-2019 N 30 PM To 05:30 PM	/lax. Marks: 56				
Instr	uctio	 ns: 1) Q. No. 2 & Q. No. 6 are compulsory. 2) Solve any two questions from each section. 3) Figures to the right indicate full marks. 4) Draw neat sketches wherever necessary. 5) Use of non programmable calculator is permitted. 					
		Section – I					
Q.2	Exp a) b) c)	lain the following: risks involved with entrepreneurship barriers to Entrepreneurship Factors affecting entrepreneurial growth.	12				
Q.3	Writ a) b)	a Notes. qualities of a successful entrepreneur types of entrepreneurs					
Q.4	Exp a) b)	Iain the following concepts.08Role of Government in promoting Entrepreneurship entrepreneurial competencies					
Q.5	Writ a) b)	e detailed notes. Women Entrepreneurship Problems of Women Entrepreneurship i remedies to solve the problems of women entrepreneurs	08 In India				
	~,	Section - II					
Q.6	a) b)	 Estimation of cost of project and means of financing 1) break even analysis 2) cash flow charts 3) financial statements 	12				
Q.7	Writ a) b)	t e Notes. Long term and Short term financial support Preparation of Business Plans	08				
Q.8	Exp a) b)	lain in brief. working capital and fixed capital assessment Preliminary and final project report preparation	08				
Q.9	Writ a) b)	te Notes. Industrial and commercial tax laws Communication skills development and barriers	08				

Set

Q

Seat No.

Seat	
No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Civil Engineering ENTREPRENEURSHIP

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) EDP (Entrepreneurship Development Programmes) is required to help
 - a) Existing entrepreneurs
 - b) First generation entrepreneurs
 - c) Future generations entrepreneurs
 - d) None of the above
- 2) A Micro Enterprise is an enterprise where investment in plant and machinery does not exceed (According to MSMED Act, 2006) _____
 - a) Rs. 15 Lakh b) Rs. 20 Lakh
 - c) Rs. 25 Lakh d) Rs. 30 Lakh
- Why should an entrepreneur do a feasibility study for starting a new venture _____.
 - a) To identify possible sources of funds
 - b) To see if there are possible barriers to success
 - c) To estimate the expected sales
 - d) To explore potential customers
- 4) Individuals influencing an entrepreneur's career choice and style are known as which of the following?
 - a) Moral-support network b) Role model
 - c) Professional support network d) Support system
- 5) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
 a) New business model
 b) Anatomization
 - a) New business modelc) None of the given options
- b) Anatomizationd) Creative destruction
- Having less than 50 percent of equity share in an international venture is called _____.
 - a) Joint Venture b) Majority interest
 - c) Minority interest d) Exporting



Max. Marks: 70

Marks: 14

Set What is the process by which individuals pursue opportunities without regard 7) to resources they currently control? a) Startup management Entrepreneurship b) c) Financial analysis d) Feasibility planning 8) A person who managed large project was termed as the entrepreneur in the a) Earliest period b) Middle ages c) 17th century d) 19th and 20th century 9) The entrepreneur was distinguished from capital provider in _____. a) Middle ages b) 17th century 18th century d) 19th and 20th century c) Which of the following is used by entrepreneurs to acquire experience in 10) an international market before making a major commitment? b) **Minority Interest** a) Merger c) Joint venture d) Majority interest 11) An enterprise is a company or business a) Company b) **Business** c) Either a or b d) None of these The activity of setting up a business or businesses, taking on _____ in 12) the hope of profit. a) Financial risk b) Loss c) Profit Technical risk d) 13) Venture capital is concerned with: New project having potential for higher profit a) New project of high technology b)

- New project having high risk c)
- d) All the above

A women entrepreneur is supposed to have a minimum financial interest 14) in share capital of entrepreneur's enterprise

35 per cent a)

b) 51 per cent

c) 25 per cent

- d) None of the above

SLR-FM-74
Seat No.			Set	R
	B.E. (Part – I	(New) (CBCS) Examination N Civil Engineering ENTREPRENEURSHIP	lov/Dec-2019	
Day 8 Time:	Date: Tuesday, 17-1 02:30 PM To 05:30 F	2-2019 M	Max. Marks	3: 56
Instru	uctions: 1) Q. No. 2 8 2) Solve any 3) Figures to 4) Draw neat 5) Use of not	Q. No. 6 are compulsory. two questions from each section. the right indicate full marks. sketches wherever necessary. n programmable calculator is permitte	ed.	
		Section – I		
Q.2	Explain the followin a) risks involved w	g: ith entrepreneurship		12
	b) barriers to Entrec) Factors affecting	preneurship a entrepreneurial growth.		
03	Write Notes	у е ер: ее алеа у е		00
Q.J	a) qualities of a sub) types of entreprint	ccessful entrepreneur eneurs		00
Q.4	Explain the followina) Role of Governrb) entrepreneurial	g concepts. nent in promoting Entrepreneurship competencies		08
Q.5	Write detailed notes a) Women Entrepr	s. eneurship Problems of Women Entre	preneurship in India	08
	b) remedies to solv	ve the problems of women entreprene	eurs	
		Section – II		
Q.6	 a) Estimation of co b) 1) break even 2) cash flow ch 3) financial state 	st of project and means of financing analysis narts tements		12
Q.7	Write Notes.a) Long term and Sb) Preparation of E	Short term financial support Susiness Plans		08
Q.8	Explain in brief.a) working capital ab) Preliminary and	and fixed capital assessment final project report preparation		08
Q.9	Write Notes.a) Industrial and cob) Communication	ommercial tax laws skills development and barriers		08

SLR-FM-74 Set R

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Civil Engineering**

ENTREPRENEURSHIP

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Draw neat sketches wherever necessary.
- 4) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- Having less than 50 percent of equity share in an international venture is 1) called
 - a) Joint Venture b) Majority interest
 - d) Exporting Minority interest c)
- 2) What is the process by which individuals pursue opportunities without regard to resources they currently control?
 - a) Startup management
- Entrepreneurship b) Feasibility planning

Middle ages

- c) Financial analysis d)
- 3) A person who managed large project was termed as the entrepreneur in the ___

b)

a) Earliest period

c)

19th and 20th century 17th century d)

The entrepreneur was distinguished from capital provider in _____. 4)

- Middle ages 17th century a) b)
 - 18th century 19th and 20th century c) d)
- 5) Which of the following is used by entrepreneurs to acquire experience in an international market before making a major commitment?
 - **Minority Interest** a) Merger b)
 - c) Joint venture d) Majority interest

An enterprise is a company or business _ 6)

- Company b) **Business** a)
- Either a or b d) None of these C)
- The activity of setting up a business or businesses, taking on _____ in 7) the hope of profit.
 - a) Financial risk b) Loss
 - c) Profit

Technical risk d)

Marks: 14

SLR-FM-74

Set

Max. Marks: 70

8) Venture capital is concerned with:

- a) New project having potential for higher profit
- b) New project of high technology
- c) New project having high risk
- d) All the above
- 9) A women entrepreneur is supposed to have a minimum financial interest in share capital of entrepreneur's enterprise _____.
 - a) 35 per cent b) 51 per cent
 - c) 25 per cent d) None of the above
- 10) EDP (Entrepreneurship Development Programmes) is required to help
 - a) Existing entrepreneurs
 - b) First generation entrepreneurs
 - c) Future generations entrepreneurs
 - d) None of the above
- 11) A Micro Enterprise is an enterprise where investment in plant and machinery does not exceed (According to MSMED Act, 2006) _____
 - a) Rs. 15 Lakh b) Rs. 20 Lakh
 - c) Rs. 25 Lakh d) Rs. 30 Lakh
- 12) Why should an entrepreneur do a feasibility study for starting a new venture _____.
 - a) To identify possible sources of funds
 - b) To see if there are possible barriers to success
 - c) To estimate the expected sales
 - d) To explore potential customers
- 13) Individuals influencing an entrepreneur's career choice and style are known as which of the following?
 - a) Moral-support network b)
- b) Role model
 - c) Professional support network d) Support system
- 14) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
 - a) New business model
- b) Anatomization
- c) None of the given options
- d) Creative destruction

SLR-FM-74

Set

		Set	S
B.E. (Part – I)	(New) (CBCS) Examination Nov/Dec-2019 Civil Engineering		

Civil Engineering ENTREPRENEURSHIP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory. 2) Solve any two questions from each section. 3) Figures to the right indicate full marks. 4) Draw neat sketches wherever necessary. 5) Use of non programmable calculator is permitted. Section – I Q.2 Explain the following: 12 risks involved with entrepreneurship a) barriers to Entrepreneurship b) Factors affecting entrepreneurial growth. C) Q.3 Write Notes. **08** qualities of a successful entrepreneur a) types of entrepreneurs b) Explain the following concepts. 80 Q.4 Role of Government in promoting Entrepreneurship a) entrepreneurial competencies b) Write detailed notes. Q.5 **08** Women Entrepreneurship Problems of Women Entrepreneurship in India a) b) remedies to solve the problems of women entrepreneurs Section – II Q.6 Estimation of cost of project and means of financing 12 a) 1) break even analysis b) 2) cash flow charts 3) financial statements Q.7 Write Notes. **08** Long term and Short term financial support a) **Preparation of Business Plans** b) Explain in brief. **08** Q.8 a) working capital and fixed capital assessment Preliminary and final project report preparation b) Write Notes. Q.9 **08** Industrial and commercial tax laws a) Communication skills development and barriers b)

SLR-FM-74

Seat No.

SLR-FM-76

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicates full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.
- 5) IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

 The overall thickness of a slab is 125mm The concrete grade is M20 and the steel grade is Fe415. The clear cover is 20 mm and the diameter of bars is 8mm according to limit state method followed in IS456:2000, the moment capacity due to concrete is _____.

	1 2		
a)	21.134 kNm	b)	28.178 kNm
c)	35.223 kNm	d)	42.267 kNm

- 2) In an under-reinforced concrete beam ____
 - a) actual depth of neutral axis is less than the critical depth of neutral axis
 - b) moment of resistance of a section of the beam is less than that of balanced section
 - c) both Option a and Option b
 - d) none of these

A square column of 5.0m unsupported length restrained in position and direction at both ends carries an axial load of 1200 kN. Assuming M20 and Fe 415 and 1% of steel, what would be the dimension of the column (to the nearest multiple of 10) when designed according to limit state method of design outlined in IS 456:2000?
 a) 420 mm x 420 mm

- a) 420 mm x 420 mm b) 350 mm x 350 mm c) 500 mm x 500 mm d) 300 mm x 300 mm
- 4) The dimension of a rectangular section is 250 mm x 300 mm. The effective cover is 50 mm. The tensile reinforcement is provided with 3 nos. 16 mm HYSD bars. The percentage of steel provided is _____.
 - a) 0.6% b) 0.7%
 - c) 0.8% d) 0.9%

Max. Marks: 70

Set

Marks: 14

02

01

SLR-FM-76

Set

- 5) A flanged beam is having the following dimension: width of flange, bf = 1000mm depth of flange, Df = 125mm, width of web, bw = 250 mm and overall depth of beam, D = 450 mm The concrete grade is M20 and the grade of reinforcing steel is Fe415. The clear cover is 25 mm. The moment capacity of the section due to concrete as per limit state method is
 - a) 95.891 kNm b) 498.52 kNm c)
 - 159.818 kNm d) 191.781 kNm
- 6) For a rectangular column of size 400mm×400mm, the value of p/fck is 02 taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M20 and the grade of steel is Fe415. The area of steel will be equal to _____.
 - 4000 mm² 3200 mm² a) b)
 - c) 2400 mm² 1600 mm² d)
- In a cantilever beam carrying gravity load, main reinforcement is 01 7) provided .
 - a) above the neutral axis b) as vertical stirrups
 - c) below the neutral axis d) as a helical reinforcement
- According to IS456:2000, the HYSD reinforcement in either direction of 01 8) slab shall not be less than
 - a) 0.10% of the total cross-sectional area
 - b) 0.12% of the total cross-sectional area
 - c) 0.15% of the total cross-sectional area
 - d) 0.20% of the total cross-sectional area
- 9) Types of shear failures can be of _____.
 - Shear-tension b) Shear-bond a)
 - Shear- compression d) All of these c)

SLR-FM-76

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and 6 are compulsory.

- Solve any two from Q. no. 3 to Q. no 5 in section I and Q. no. 7 to Q. no. 9 in section II.
- 3) Use of IS 456:2000 Original and non programmable calculator is allowed.
- 4) Draw neat sketches of reinforcement details.

Section – I

- **Q.2** A reinforced concrete beam section reinforced on the tension side is 250 mm wide with an effective depth of 400mm. It is reinforced with 4 bars of 25mm diameter. Find the ultimate moment of resistance. Take F_{ck} = 20 N/mm² and F_{y} = 415 N/mm²
- Q.3 Design an R.C.C slab of size 4.5 m X 6 m. The edges of slab are simply supported and the corners are not held down. The slab is carrying a live load of 3 kN/m². The slab has bearing of 230 mm on the supporting walls. Use M₂₅ concrete and Fe ₅₀₀ steel.
- Q.4 A floor of a hall 12 m x 6 m to the centres of the supporting walls consists of 3 beams spaced at 3 m apart, the thickness of the slab being 130 mm. Design an intermediate beam. Allow a live load of 3500 N/m². The dead load of the floor finish may be taken as 500 N/m². Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.5 A doubly reinforced beam is 200 mm x 350 mm in section. The areas of the compression and tensile steel are 1200 mm² and 1600 mm² respectively. The effective cover to the compression reinforcement is 50mm. Find the ultimate moment of resistance of the beam section. Use M₂₅ and Fe ₅₀₀ steel. For determining Fsc consider stress of 403.5 N/mm² for d'\d(0.125) and 395 N/mm² for d'\d (0.150).

Section – II

- Q.6 Determine the safe axial load for a short circular column 425 mm in diameter, reinforced with 6 bars of 22 mm diameter. It is provided with 8 mm diameter helical reinforcement at a pitch of 40 mm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.7 Design a rectangular beam 450 mm wide subjected to a bending moment of 50 kNm, a shear force of 32 kN and a torsion of 28 kNm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.8 Design a circular column to carry an axial load of 1650 kN. The column is having spiral ties. The column is 3.2 m long and in effectively held in at both ends, but not restrained against rotation. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.9 Design a three span continuous beam rectangular beam of span of 5 m each to carry a dead load of 15 kN/m (excluding self weight of beam) and live load of 10 kN/m. The beam is supported by columns. Use M₂₅ concrete and Fe₄₁₅ steel. Sketch the reinforcement details.

Max. Marks: 56

Set P

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicates full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.
- 5) IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- For a rectangular column of size 400mm×400mm, the value of p/fck is taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M20 and the grade of steel is Fe415. The area of steel will be equal to _____.
 a) 4000 mm²
 b) 3200 mm²
 - c) 2400 mm^2 d) 1600 mm^2
- In a cantilever beam carrying gravity load, main reinforcement is provided _____.
 - a) above the neutral axis b) as vertical stirrups
 - c) below the neutral axis d) as a helical reinforcement
- According to IS456:2000, the HYSD reinforcement in either direction of slab shall not be less than _____.
 - a) 0.10% of the total cross-sectional area
 - b) 0.12% of the total cross-sectional area
 - c) 0.15% of the total cross-sectional area
 - d) 0.20% of the total cross-sectional area
- 4) Types of shear failures can be of _____.
 - a) Shear- tension b) Shear- bond
 - c) Shear- compression d) All of these
- 5) The overall thickness of a slab is 125mm The concrete grade is M20 and the steel grade is Fe415. The clear cover is 20 mm and the diameter of bars is 8mm according to limit state method followed in IS456:2000, the moment capacity due to concrete is _____.
 - a) 21.134 kNm b) 28.178 kNm c) 35.223 kNm d) 42.267 kNm
- 6) In an under-reinforced concrete beam ____
 - a) actual depth of neutral axis is less than the critical depth of neutral axis
 - b) moment of resistance of a section of the beam is less than that of balanced section
 - c) both Option a and Option b
 - d) none of these



Marks: 14

SLR-FM-76

01

	SLR-FM-	-76
	Set	Q
7)	A square column of 5.0m unsupported length restrained in position and direction at both ends carries an axial load of 1200 kN. Assuming M20 and Fe 415 and 1% of steel, what would be the dimension of the column (to the nearest multiple of 10) when designed according to limit state method of design outlined in IS 456:2000? a) 420 mm x 420 mm b) 350 mm x 350 mm	02
8)	c)500 mm x 500 mmd)300 mm x 300 mmThe dimension of a rectangular section is 250 mm x 300 mm. The effective cover is 50 mm. The tensile reinforcement is provided with 3 nos. 16 mm HYSD bars. The percentage of steel provided isa)0.6%b)0.7%c)0.8%d)0.9%	02
9)	A flanged beam is having the following dimension: width of flange, bf = 1000mm depth of flange, Df = 125mm, width of web, bw = 250 mm and overall depth of beam, D = 450 mm The concrete grade is M20 and the grade of reinforcing steel is Fe415. The clear cover is 25 mm. The moment capacity of the section due to concrete as per limit state method is	02

- 95.891 kNm a)
- 159.818 kNm C)

- b) d) 498.52 kNm
 - 191.781 kNm

SLR-FM-76

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and 6 are compulsory.

- Solve any two from Q. no. 3 to Q. no 5 in section I and Q. no. 7 to Q. no. 9 in section II.
- 3) Use of IS 456:2000 Original and non programmable calculator is allowed.
- 4) Draw neat sketches of reinforcement details.

Section – I

- **Q.2** A reinforced concrete beam section reinforced on the tension side is 250 mm wide with an effective depth of 400mm. It is reinforced with 4 bars of 25mm diameter. Find the ultimate moment of resistance. Take F_{ck} = 20 N/mm² and F_{y} = 415 N/mm²
- Q.3 Design an R.C.C slab of size 4.5 m X 6 m. The edges of slab are simply supported and the corners are not held down. The slab is carrying a live load of 3 kN/m². The slab has bearing of 230 mm on the supporting walls. Use M₂₅ concrete and Fe ₅₀₀ steel.
- Q.4 A floor of a hall 12 m x 6 m to the centres of the supporting walls consists of 3 beams spaced at 3 m apart, the thickness of the slab being 130 mm. Design an intermediate beam. Allow a live load of 3500 N/m². The dead load of the floor finish may be taken as 500 N/m². Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.5 A doubly reinforced beam is 200 mm x 350 mm in section. The areas of the compression and tensile steel are 1200 mm² and 1600 mm² respectively. The effective cover to the compression reinforcement is 50mm. Find the ultimate moment of resistance of the beam section. Use M₂₅ and Fe ₅₀₀ steel. For determining Fsc consider stress of 403.5 N/mm² for d'\d(0.125) and 395 N/mm² for d'\d (0.150).

Section – II

- Q.6 Determine the safe axial load for a short circular column 425 mm in diameter, reinforced with 6 bars of 22 mm diameter. It is provided with 8 mm diameter helical reinforcement at a pitch of 40 mm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.7 Design a rectangular beam 450 mm wide subjected to a bending moment of 50 kNm, a shear force of 32 kN and a torsion of 28 kNm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.8 Design a circular column to carry an axial load of 1650 kN. The column is having spiral ties. The column is 3.2 m long and in effectively held in at both ends, but not restrained against rotation. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.9 Design a three span continuous beam rectangular beam of span of 5 m each to carry a dead load of 15 kN/m (excluding self weight of beam) and live load of 10 kN/m. The beam is supported by columns. Use M₂₅ concrete and Fe₄₁₅ steel. Sketch the reinforcement details.

Max. Marks: 56

Set Q

01

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering

DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicates full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.
- 5) IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- A flanged beam is having the following dimension: width of flange, bf = 1000mm depth of flange, Df = 125mm, width of web, bw = 250 mm and overall depth of beam, D = 450 mm The concrete grade is M20 and the grade of reinforcing steel is Fe415. The clear cover is 25 mm. The moment capacity of the section due to concrete as per limit state method is _____.
 - a) 95.891 kNm b) 498.52 kNm
 - c) 159.818 kNm d) 191.781 kNm
- For a rectangular column of size 400mm×400mm, the value of p/fck is taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M20 and the grade of steel is Fe415. The area of steel will be equal to _____.
 - a) 4000 mm^2 b) 3200 mm^2
 - c) 2400 mm^2 d) 1600 mm^2
- 3) In a cantilever beam carrying gravity load, main reinforcement is provided _____.
 a) above the neutral axis b) as vertical stirrups
 - c) below the neutral axis d) as a helical reinforcement
- According to IS456:2000, the HYSD reinforcement in either direction of slab shall not be less than _____.
 - a) 0.10% of the total cross-sectional area
 - b) 0.12% of the total cross-sectional area
 - c) 0.15% of the total cross-sectional area
 - d) 0.20% of the total cross-sectional area

5) Types of shear failures can be of _____.

- a) Shear- tension b) Shear- bond
- c) Shear- compression d) All of these

SLR-FM-76



Max. Marks: 70

Marks: 14

	SLR-FM	-76
	Set	R
6)	The overall thickness of a slab is 125mm The concrete grade is M20 and the steel grade is Fe415. The clear cover is 20 mm and the diameter of bars is 8mm according to limit state method followed in IS456:2000, the moment capacity due to concrete is	02
	c) 35.223 kNm d) 42.267 kNm	
7)	 In an under-reinforced concrete beam a) actual depth of neutral axis is less than the critical depth of neutral axis b) moment of resistance of a section of the beam is less than that of balanced section c) both Option a and Option b d) none of these 	01
8)	A square column of 5.0m unsupported length restrained in position and direction at both ends carries an axial load of 1200 kN. Assuming M20 and Fe 415 and 1% of steel, what would be the dimension of the column (to the nearest multiple of 10) when designed according to limit state method of design outlined in IS 456:2000? a) 420 mm x 420 mm b) 350 mm x 350 mm c) 500 mm x 500 mm d) 300 mm x 300 mm	02
9)	The dimension of a rectangular section is 250 mm x 300 mm. The effective cover is 50 mm. The tensile reinforcement is provided with 3 nos. 16 mm HYSD bars. The percentage of steel provided is a) 0.6% b) 0.7%	02

c) 0.8% d) 0.9%

SLR-FM-76

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and 6 are compulsory.

- Solve any two from Q. no. 3 to Q. no 5 in section I and Q. no. 7 to Q. no. 9 in section II.
- 3) Use of IS 456:2000 Original and non programmable calculator is allowed.
- 4) Draw neat sketches of reinforcement details.

Section – I

- **Q.2** A reinforced concrete beam section reinforced on the tension side is 250 mm wide with an effective depth of 400mm. It is reinforced with 4 bars of 25mm diameter. Find the ultimate moment of resistance. Take F_{ck} = 20 N/mm² and F_{y} = 415 N/mm²
- Q.3 Design an R.C.C slab of size 4.5 m X 6 m. The edges of slab are simply supported and the corners are not held down. The slab is carrying a live load of 3 kN/m². The slab has bearing of 230 mm on the supporting walls. Use M₂₅ concrete and Fe ₅₀₀ steel.
- Q.4 A floor of a hall 12 m x 6 m to the centres of the supporting walls consists of 3 beams spaced at 3 m apart, the thickness of the slab being 130 mm. Design an intermediate beam. Allow a live load of 3500 N/m². The dead load of the floor finish may be taken as 500 N/m². Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.5 A doubly reinforced beam is 200 mm x 350 mm in section. The areas of the compression and tensile steel are 1200 mm² and 1600 mm² respectively. The effective cover to the compression reinforcement is 50mm. Find the ultimate moment of resistance of the beam section. Use M₂₅ and Fe ₅₀₀ steel. For determining Fsc consider stress of 403.5 N/mm² for d'\d(0.125) and 395 N/mm² for d'\d (0.150).

Section – II

- Q.6 Determine the safe axial load for a short circular column 425 mm in diameter, reinforced with 6 bars of 22 mm diameter. It is provided with 8 mm diameter helical reinforcement at a pitch of 40 mm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.7 Design a rectangular beam 450 mm wide subjected to a bending moment of 50 kNm, a shear force of 32 kN and a torsion of 28 kNm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.8 Design a circular column to carry an axial load of 1650 kN. The column is having spiral ties. The column is 3.2 m long and in effectively held in at both ends, but not restrained against rotation. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.9 Design a three span continuous beam rectangular beam of span of 5 m each to carry a dead load of 15 kN/m (excluding self weight of beam) and live load of 10 kN/m. The beam is supported by columns. Use M₂₅ concrete and Fe₄₁₅ steel. Sketch the reinforcement details.

Max. Marks: 56

Set R

01

SLR-FM-76

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

a) 0.6%

c) 0.8%

3)

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicates full marks.
- 3) Non programmable calculator is allowed.
- 4) Assume suitable data if required and state it clearly.
- 5) IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

A square column of 5.0m unsupported length restrained in position and direction at both ends carries an axial load of 1200 kN. Assuming M20 and Fe 415 and 1% of steel, what would be the dimension of the column (to the nearest multiple of 10) when designed according to limit state method of design outlined in IS 456:2000?

 a) 420 mm x 420 mm
 b) 350 mm x 350 mm

b)

d)

0.7%

0.9%

- c) 500 mm x 500 mm d) 300 mm x 300 mm
- The dimension of a rectangular section is 250 mm x 300 mm. The effective cover is 50 mm. The tensile reinforcement is provided with 3 nos. 16 mm HYSD bars. The percentage of steel provided is

02

02

bf = 1000mm depth of flange, Df = 125mm, width of web, bw = 250 mm and overall depth of beam, D = 450 mm The concrete grade is M20 and the grade of reinforcing steel is Fe415. The clear cover is 25 mm. The moment capacity of the section due to concrete as per limit state method is _____.

A flanged beam is having the following dimension: width of flange,

- a) 95.891 kNm b) 498.52 kNm c) 159.818 kNm d) 191.781 kNm
- For a rectangular column of size 400mm×400mm, the value of p/fck is taken as 0.10 for using interaction curve of columns as given in SP-16. The grade of concrete is M20 and the grade of steel is Fe415. The area of steel will be equal to _____.
 - a) 4000 mm^2 b) 3200 mm^2
 - c) 2400 mm^2 d) 1600 mm^2
- In a cantilever beam carrying gravity load, main reinforcement is provided _____.
 - a) above the neutral axis b) as vertical stirrups
 - c) below the neutral axis d) as a helical reinforcement

Max. Marks: 70

Marks: 14

Set

Page **11** of **12**

slab shall not be less than _____. a) 0.10% of the total cross-sectional area b) 0.12% of the total cross-sectional area c) 0.15% of the total cross-sectional area d) 0.20% of the total cross-sectional area 7) Types of shear failures can be of _____. 01 a) Shear-tension b) Shear-bond c) Shear- compression All of these d) The overall thickness of a slab is 125mm The concrete grade is M20 and 8) the steel grade is Fe415. The clear cover is 20 mm and the diameter of

According to IS456:2000, the HYSD reinforcement in either direction of

- 02 bars is 8mm according to limit state method followed in IS456:2000, the moment capacity due to concrete is
 - 21.134 kNm 28.178 kNm a) b)
 - c) 35.223 kNm d) 42.267 kNm
- 9) In an under-reinforced concrete beam
 - actual depth of neutral axis is less than the critical depth of neutral a) axis
 - b) moment of resistance of a section of the beam is less than that of balanced section
 - both Option a and Option b c)
 - d) none of these

6)

SLR-FM-76 S Set

01

Page **12** of **12**

SLR-FM-76

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – I

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and 6 are compulsory.

- Solve any two from Q. no. 3 to Q. no 5 in section I and Q. no. 7 to Q. no. 9 in section II.
- 3) Use of IS 456:2000 Original and non programmable calculator is allowed.
- 4) Draw neat sketches of reinforcement details.

Section – I

- **Q.2** A reinforced concrete beam section reinforced on the tension side is 250 mm wide with an effective depth of 400mm. It is reinforced with 4 bars of 25mm diameter. Find the ultimate moment of resistance. Take F_{ck} = 20 N/mm² and F_{y} = 415 N/mm²
- Q.3 Design an R.C.C slab of size 4.5 m X 6 m. The edges of slab are simply supported and the corners are not held down. The slab is carrying a live load of 3 kN/m². The slab has bearing of 230 mm on the supporting walls. Use M₂₅ concrete and Fe ₅₀₀ steel.
- Q.4 A floor of a hall 12 m x 6 m to the centres of the supporting walls consists of 3 beams spaced at 3 m apart, the thickness of the slab being 130 mm. Design an intermediate beam. Allow a live load of 3500 N/m². The dead load of the floor finish may be taken as 500 N/m². Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.5 A doubly reinforced beam is 200 mm x 350 mm in section. The areas of the compression and tensile steel are 1200 mm² and 1600 mm² respectively. The effective cover to the compression reinforcement is 50mm. Find the ultimate moment of resistance of the beam section. Use M₂₅ and Fe ₅₀₀ steel. For determining Fsc consider stress of 403.5 N/mm² for d'\d(0.125) and 395 N/mm² for d'\d (0.150).

Section – II

- Q.6 Determine the safe axial load for a short circular column 425 mm in diameter, reinforced with 6 bars of 22 mm diameter. It is provided with 8 mm diameter helical reinforcement at a pitch of 40 mm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.7 Design a rectangular beam 450 mm wide subjected to a bending moment of 50 kNm, a shear force of 32 kN and a torsion of 28 kNm. Use M₂₀ concrete and Fe ₄₁₅ steel.
- Q.8 Design a circular column to carry an axial load of 1650 kN. The column is having spiral ties. The column is 3.2 m long and in effectively held in at both ends, but not restrained against rotation. Use M₂₀ concrete and Fe₅₀₀ steel.
- Q.9 Design a three span continuous beam rectangular beam of span of 5 m each to carry a dead load of 15 kN/m (excluding self weight of beam) and live load of 10 kN/m. The beam is supported by columns. Use M₂₅ concrete and Fe₄₁₅ steel. Sketch the reinforcement details.

Max. Marks: 56

Set S

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In the designation of concrete mix, 'M' refers to the mix and the number to 1) the specified compressive strength of '150mm' size cube at '28 days' expressed in unit.
 - a) KN/mm² KN/m² b) N/m²
 - c) N/mm² d)
- If rise and tread of a step is 0.15m and 0.25m respectively, then the 2) volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be
 - 0.337 a) 0.3375 b) c) 0.34 d) 0.33
- If thickness of concreting is less than 100mm, the concreting in RCC slab 3) is measured in _____

b)

Sq.m

- a) Running m
- c) Cu.m d) None of the above

4) If the wall thickness is one and half brick thick, the brickwork is measured in

- a) Running m b) Sq.m
 - c) Cu.m d) None of the above

The minimum number of layers for compaction of 0.60m deep plinth filling, 5) shall be .

- a) 1 2 b) 3 d) 5 c)
- 6) The estimate of property may be needed for .
 - Mortgage of property a)
 - b) Taxation
 - c) loan for construction of property
 - d) Calculating the compensation during land acquisition
- The valuation of property may be needed for _____. 7)
 - a) Preparation of Estimate
 - Calculating the stamp duty of sale deed b)
 - c) Project planning
 - d) None of the above

SLR-FM-77

Max. Marks: 70

Marks: 14

Set

 Escalation clause is provided to cover unexpected cost due to fluctuation in the prices of _____.

b)

d)

Overheads

work charged establishment

a) raw material

c) contingencies

The lease is

9)

- .
- a) Transferable, heritable, revocable
- b) Transferable, revocable, non-heritable
- c) Transferable, heritable, non-revocable
- d) heritable, revocable, non- transferable
- 10) Years purchase in perpetuity for highest rate of interest 2.5% will be, _____.
 - a) 2.5 b) 100
 - c) 40 d) 25
- 11) In long and short wall method of estimation, length of Short wall is centre to centre distance between extreme opposite walls in shorter directions of ground floor plan _____.
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side
- 12) Earnest money is paid to enable the Government to ensure that a tenderer does not _____.
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
- 13) No deductions are required during the measurement of concreting work if area of opening is less than or equal to _____.
 - a) 0.1 Sq.m. b) 0.5 Sq.m
 - c) 1.0 Sq.m d) 3.0 Sq.m
- 14) For RCC framed structures types of buildings, economic life shall be taken as below _____.
 - a) 100 years b)
- b) 75 years

c) 50 years

d) 40 years

SLR-FM-77

Set

Set

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

		Section – I	
Q.2	Pre follo a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of	04
Q.3	b) c) a)	Concreting for RCC footing in M20. Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated.	04 04 04
	b)	What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
Q.4	Wri a) b)	i te the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	08
Q.5	Cai a) d)	rry out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing Section – II	08
Q.6	a) b)	Compare Item Rate Contract and Percentage Rate Contract. What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net annual rent at 8% in perpetuity with Years Purchase.	04

b) Differentiate between free hold and lease hold property.

06

- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

.....

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO	10059232		T	1 100	1111	and the second second	
	LXB	D	FCOTING STIEL	CALENA		STIPPINS	
C-1,2,9,11,25,31, 42,44	1.20 X 1,45	0,400	MAIN 10 0 165 c/c (08 NO) DISTRI 10 0 157 c/c (07 NO)	200 X 450	10012 8012	SMM@150c/cD	
C - 3,4,5,6,48,49, 50,51	1.95 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12012	BMM@150c/cDi	
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@ 1506/cDC	
C - 10,20,23,28, 29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 @160 c/c (09 NO) DISTRI 10 @ 150 c/c (05 NO)	200 X 450	6016+2012 4016-2012	BMM@150c/cDC	
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 0 150 c/c (11 NO) DISTRI 10 0 150 c/c (09 NO)	200 X 530	6016+4012 4016+4012	8MM@ 1500/cDO	
C - 13.14,17,18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c. (12 NO) DISTRI 10 # 135 c/c (10 NO)	200 X 600 200 X 530	6016+6012 2016+8012	8MM@150c/cDO	
C-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 390 200 X 300	\$₹12 6€12	8MM@150c/cD0	
C - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 0 120 c/c (16 NO) DISTRI 100 120 c/c (14 NO)	300 X 530	8 Ø 16 6 Ø 16	8MM@150chDO	

SLR-FM-77 Set P



Page 6 of 20

SLR-FM-77

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- 1) Escalation clause is provided to cover unexpected cost due to fluctuation in the prices of
 - a) raw material c) contingencies
- b) Overheads d) work charged establishment

- 2) The lease is
 - a) Transferable, heritable, revocable
 - b) Transferable, revocable, non-heritable
 - c) Transferable, heritable, non-revocable
 - d) heritable, revocable, non- transferable
- Years purchase in perpetuity for highest rate of interest 2.5% will be, _____. 3)
 - a) 2.5 b) 100
 - d) c) 40 25
- In long and short wall method of estimation, length of Short wall is centre 4) to centre distance between extreme opposite walls in shorter directions of ground floor plan
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side
- 5) Earnest money is paid to enable the Government to ensure that a tenderer does not
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
- 6) No deductions are required during the measurement of concreting work if area of opening is less than or equal to .
 - a) 0.1 Sq.m. 0.5 Sq.m b)
 - c) 1.0 Sq.m d) 3.0 Sq.m
- 7) For RCC framed structures types of buildings, economic life shall be taken as below ____
 - a) 100 years 75 years b) c) 50 years d)
 - 40 years



Marks: 14

Max. Marks: 70

Set 8) In the designation of concrete mix, 'M' refers to the mix and the number to the specified compressive strength of '150mm' size cube at '28 days' expressed in _____ unit. KN/m² a) KN/mm² b) N/mm² d) N/m^2 c) If rise and tread of a step is 0.15m and 0.25m respectively, then the 9) volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be 0.337 a) 0.3375 b) d) 0.33 c) 0.34 10) If thickness of concreting is less than 100mm, the concreting in RCC slab is measured in a) Running m b) Sq.m c) Cu.m d) None of the above 11) If the wall thickness is one and half brick thick, the brickwork is measured in Running m Sq.m b) a) c) Cu.m d) None of the above The minimum number of layers for compaction of 0.60m deep plinth filling, 12) shall be _____. 1 b) a) 2 3 d) 5 c) 13) The estimate of property may be needed for _____. Mortgage of property a) b) Taxation c) loan for construction of property d) Calculating the compensation during land acquisition The valuation of property may be needed for _____. 14)

- a) Preparation of Estimate
- b) Calculating the stamp duty of sale deed
- c) Project planning
- d) None of the above

SLR-FM-77

Set

Q

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

0......

		Section – I	
Q.2	Pre folle a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of excavation as 1500mm.	04
	b)	Concreting for RCC footing in M20.	04
Q.3	c) a) b)	Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated. What are the thumb rules for calculating quantity of reinforcement required	04 04
	,	for Residential building?	
Q.4	Wri a) b)	i te the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	80
Q.5	Cai a) d)	rry out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing	08
		Section – II	
Q.6	a) b)	Compare Item Rate Contract and Percentage Rate Contract. What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net	04

annual rent at 8% in perpetuity with Years Purchase. b) Differentiate between free hold and lease hold property.

06

- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

.....

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO	P2001	G (9)22	T	602.929 9.929		- CTIDDUC
	LXB	D	FOOTING STLEL			
C-1,2,9,11,25,31, 42,44	1.20 X 1,45	0.400	MAIN 10 \$165 c/c (08 NO) DISTRI 10 \$157 c/c (07 NO)	200 X 450 200 X 350	10012 6542	8MM@150c/cD
C - 3,4,5,6,48,49, 50,51	1.05 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12#16 4 D16 + 6#10	8MM@150c/cD
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@ 1506/cD
C - 10,20,23,28, 29,43,45,48, 47,52	1.30 X 1.55	0.43	MAIN 10 @160 c/c (09 NO) DISTRI 10 @ 150 c/c (05 NO)	200 X 450	6016+2012 1016+2012	BMM@150c/cD
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 0 150 c/c (11 NO) DISTRI 10 0 150 c/c (09 NO)	200 X 530	6016+4012	8MM@150c/cD
C - 13.14.17.18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c. (12 NO) DISTRI 10 # 135 c/c. (10 NO)	200 X 600 200 X 530	6 0 16 + 6 0 12 2 0 16 + 6 0 12	8MM@150c/cDC
C-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 380 200 X 300	8012 6012	8MM@150c/cD(
C - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 0 120 c/c (16 NO) DISTRI 10 120 c/c (14 NO)	300 X 530	8016	BMM@150ch.DK

SLR-FM-77 Set Q



SLR-FM-77

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The minimum number of layers for compaction of 0.60m deep plinth filling, 1) shall be _____.
 - 1 2 b) a)
 - c) 3 d) 5
- 2) The estimate of property may be needed for .
 - a) Mortgage of property
 - b) Taxation
 - c) loan for construction of property
 - d) Calculating the compensation during land acquisition
- The valuation of property may be needed for _____. 3)
 - a) Preparation of Estimate
 - b) Calculating the stamp duty of sale deed
 - Project planning c)
 - d) None of the above
- 4) Escalation clause is provided to cover unexpected cost due to fluctuation in the prices of
 - a) raw material
 - c) contingencies

- The lease is 5)
 - a) Transferable, heritable, revocable
 - b) Transferable, revocable, non-heritable
 - Transferable, heritable, non-revocable c)
 - d) heritable, revocable, non- transferable
- Years purchase in perpetuity for highest rate of interest 2.5% will be, _____. 6)
 - a) 2.5 b) 100
 - 40 d) c) 25
- In long and short wall method of estimation, length of Short wall is centre 7) to centre distance between extreme opposite walls in shorter directions of ground floor plan
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side

Max. Marks: 70

- b) Overheads
- d) work charged establishment

R

Seat No.

- 8) Earnest money is paid to enable the Government to ensure that a tenderer does not
 - a) back out of his tender before its acceptance
 - refuse to execute the work after it has been awarded to him b)
 - c) compromise with quality of work
 - d) a or b
- 9) No deductions are required during the measurement of concreting work if area of opening is less than or equal to _
 - a) 0.1 Sq.m. b) 0.5 Sq.m
 - c) 1.0 Sq.m d) 3.0 Sa.m
- For RCC framed structures types of buildings, economic life shall be taken 10) as below _____.
 - a) 100 years 75 years b)
 - c) 50 years d) 40 years
- 11) In the designation of concrete mix, 'M' refers to the mix and the number to the specified compressive strength of '150mm' size cube at '28 days' expressed in unit.
 - a) KN/mm² b) KN/m²
 - c) N/mm^2 d) N/m^2
- 12) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be
 - a) 0.3375 b) 0.337 c) 0.34 d) 0.33
- 13) If thickness of concreting is less than 100mm, the concreting in RCC slab is measured in
 - a) Running m
- b) Sq.m d)
- None of the above
- 14) If the wall thickness is one and half brick thick, the brickwork is measured
 - in
 - a) Running m

b) Sq.m

c) Cu.m

c) Cu.m

d) None of the above

SLR-FM-77

Set

Set

R

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

		Section – I	
Q.2	Pre follo a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of excavation as 1500mm.	04
Q.3	b) c) a)	Concreting for RCC footing in M20. Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated.	04 04 04
	b)	What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
Q.4	Wri a) b)	i te the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	08
Q.5	Cai a) d)	Try out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing	08
Q.6	a)	Compare Item Rate Contract and Percentage Rate Contract.	04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net annual rent at 8% in perpetuity with Years Purchase.	04

b) Differentiate between free hold and lease hold property.

Set R

- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

.....

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO.	1000.9	G (9)22	1	Con 1834			
	LXB	D	FOOTRAG STEEL	SIZE CTER		STIRRIES	
C-1,2,9,11,25,31, 42,44	1.20 X 1,45	0.400	MAIN 10 0 168 c/c (08 NO) DISTRI 10 0 157 c/c (07 NO)	200 X 450 200 X 350	10012	SMM@150c/cD	
C - 3,4,5,6,48,49, 50,51	1.05 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c. (17 NO)	300 X 600 300 X 530	12012 4 0 16 + 6 5 10	BMM@150c/cDi	
C - 7,8,15,16,27, 30,37,38	1.35 X 1.69	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@1506/cDC	
C-10,20,23,28, 29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 0 160 c/c (09 NO) DISTRI 10 0 150 c/c (06 NO)	200 X 450 200 X 390	6016+2012 1016+2012	BMM@150cic.DC	
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 \$ 150 c/c (11 NO) DISTRI 10 \$ 150 c/c (09 NO)	200 X 530	6016+4012 4016+4012	8MM@ 150c/cDO	
C-13.14.17.18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c (12 NO) DISTRI 10 # 135 c/c (10 NO)	200 X 600 200 X 530	6016+6012 2016+8012	8MM@150c/cDO	
C-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 390 200 X 300	8 12 6 12	8MM@150c/cDO	
2 - 35,36,39,40	1.75 X 2.00	0.560	MAIN 10 9,120 c/c (16 NO) DISTRI 10 9 120 c/c (14 NO)	300 X 530 300 X 450	8 Ø 16 6 Ø 16	8MM@150c/cDO	

SLR-FM-77 Set R



Seat No.

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - 1) Years purchase in perpetuity for highest rate of interest 2.5% will be, _____.
 - a) 2.5 b) 100
 - c) 40 d) 25
 - In long and short wall method of estimation, length of Short wall is centre to centre distance between extreme opposite walls in shorter directions of ground floor plan _____.
 - a) Minus one breadth of item on each side
 - b) Plus one breadth of item on each side
 - c) Minus half breadth of item on each side
 - d) Plus half breadth of item on each side
 - Earnest money is paid to enable the Government to ensure that a tenderer does not _____.
 - a) back out of his tender before its acceptance
 - b) refuse to execute the work after it has been awarded to him
 - c) compromise with quality of work
 - d) a or b
 - 4) No deductions are required during the measurement of concreting work if area of opening is less than or equal to _____.
 - a) 0.1 Sq.m. b) 0.5 Sq.m
 - c) 1.0 Sq.m d) 3.0 Sq.m
 - 5) For RCC framed structures types of buildings, economic life shall be taken as below _____.
 - a) 100 years b) 75 years
 - c) 50 years d) 40 years
 - 6) In the designation of concrete mix, 'M' refers to the mix and the number to the specified compressive strength of '150mm' size cube at <u>'28 days'</u> expressed in unit.
 - a) KN/mm^2 b) KN/m^2 c) N/mm^2 d) N/m^2
 - 7) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be
 - a) 0.3375 b) 0.337
 - c) 0.34 d) 0.33

Max. Marks: 70

Marks: 14



SLR-FM-77

- is measured in a) Running m b) Sq.m
 - c) Cu.m d) None of the above
- 9) If the wall thickness is one and half brick thick, the brickwork is measured in
 - a) Running m b) Sq.m c) Cu.m d) None of the above
- The minimum number of layers for compaction of 0.60m deep plinth filling, 10) shall be _____.
 - 2 a) 1 b)
 - c) 3 d) 5
- 11) The estimate of property may be needed for _____.
 - a) Mortgage of property
 - b) Taxation

8)

- c) loan for construction of property
- d) Calculating the compensation during land acquisition
- The valuation of property may be needed for _____. 12)
 - a) Preparation of Estimate
 - b) Calculating the stamp duty of sale deed
 - c) Project planning
 - d) None of the above
- Escalation clause is provided to cover unexpected cost due to fluctuation 13) in the prices of _____
 - a) raw material

b) Overheads

c) contingencies

d) work charged establishment

- 14) The lease is
 - a) Transferable, heritable, revocable
 - b) Transferable, revocable, non-heritable
 - c) Transferable, heritable, non-revocable
 - d) heritable, revocable, non- transferable

Set

S

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering QUANTITY SURVEYING AND VALUATION

Day & Date: Tuesday,10-12-2019 Time: 02:30 PM To 06:30 PM

Max. Marks: 56

Instructions: 1) Q.No.2 and Q.No.9 are compulsory.

2) Solve any two from remaining question from each section.

3) Figures to the right indicate full marks.

		Section – I	
Q.2	Pre follo a)	pare the measurement sheet and enter the measurements to calculate owing quantities for Column footing for column number C - 21, 22 Earthwork in excavation for RCC footing (including additional space for centering and strutting) shown in attached Drawing. Assume depth of	04
Q.3	b) c) a)	 Concreting for RCC footing in M20. Concreting in M7.5 for PCC 100mm thick under footing. Prepare a preliminary estimate for civil works required for establishing a polytechnic building requiring a total carpet area of 6000Sq.M.This includes actual total area required for classrooms, labs, office, store, etc. Suitable extra provision as 12% of the carpet area be made for walls, verandah corridors, toilets, staircase, etc. The plinth area rate is Rs. 15000/Sq.M. Suitable extra provision as 8% of the building cost be made for water supply,10% for electric fitting, 6% for other services, 1.5% for special architecture treatment of the building cost is also to be calculated. 	04 04 04
	b)	What are the thumb rules for calculating quantity of reinforcement required for Residential building?	04
Q.4	Wri a) b)	i te the detailed specifications for Cement Concrete M20 for Column footing Earthwork for excavation in Column footing	08
Q.5	Cai a) d)	rry out Rate analysis for the following items Cement Concrete 1:1.5:3 for Column footing Plane Cement Concrete 100mm thick in (1:4:8) below column footing Section – II	08
~ ~	-)	Occurrence litere Data Contract and Demonstrate Data Contract	•
Q.6	a) b)	What are contents for first and second envelope in two envelope system?	04 04
Q.7	a) b)	Write any eight factors affecting the valuation of properties. Differentiate between salvage value and scrap value.	04 04
Q.8	a)	Find the value of a four storied residential apartment with three flats per floor. Each flat is let out on a gross rent of Rs. 120000/year. The municipal tax is Rs.8000/flat/ year other outgoings are Lift maintenance, Salary of watchmen and sweepers, electricity charges all inclusive Rs.24000/flat/year. Calculate the value of one flat capitalizing the net	04

annual rent at 8% in perpetuity with Years Purchase.b) Differentiate between free hold and lease hold property.

Set S

06

06

- Q.9 a) An old building has been purchases by a person at a cost of Rs. 30,00,000/- excluding the cost of the land. Calculate the amount of annual Sinking fund at 4% interest assuming the future life of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
 - **b)** What is the valuation of a property in 2019, with following details of a building? Assume 10% scrap value at the end of useful life.

Nº 1 - 1 . 1 . . .

Sr.	Description	Area	Rate	Total life	Built
No	Description	(Sq.M)	Rs/SqM	(year)	in
1.	Main Factory Building RCC skelection used as dyeing unit and old office G+1	700.92	11000	75	1984
2.	Mezzanine floor in main building	449.04	4500	75	2002

COLUMN NO.	1001042 322		CONTRAIN DITT 2	COLUNN		STIRRUPS
A 40044055	LXB		Provinda 2:002	SIZE STEEL		
42,44	1.20 X 1.45	0.400	MAIN 10 1 165 c/c. (08 NO) DISTRI 10 1 157 c/c. (07 NO)	200 X 450 200 X 350	10012	8MM@150c/cD
C - 3,4,5,6,48,49, 50,51	1.95 X 2.25	0.575	MAIN 10 0 113 c/c. (19 NO) DISTRI 10 0 110 c/c (17 NO)	300 X 600 300 X 530	12 \$ 16 4 D 16 + 6 # 12	BMM@150c/cDi
C - 7,8,15,16,27, 30,37,38	1.35 X 1.60	0.46	MAIN 10 # 150 c/c (10 NO) DISTRI 10 # 156 c/c (08 NO)	200 X 450 200 X 380	6016+4012	8MM@ 1506/cDC
C - 10,20,23,28, 29,43,45,46, 47,52	1.30 X 1.55	0.43	MAIN 10 0 160 c/c (09 NO) DISTRI 10 0 150 c/c (05 NO)	200 X 450 200 X 390	6016+2012	BMM@150cic.DC
C - 12,19,24,25,32, 33,34,41	1.45 X 1.75	0.509	MAIN 10 0 150 c/c (11 NO) DISTRI 10 0 150 c/c (09 NO)	200 X 530 200 X 450	6016+4012 4016+4012	5MM@150c/cDO
C-13.14,17,18	1.45 X 1.85	0.520	MAIN 10 # 145 c/c (12 NO) DISTRI 10 # 135 c/c (10 NO)	200 X 600 200 X 530	6016+6012 2016+8012	8MM@150c/cDO
0-21,22	1.05 X 1.25	0.320	MAIN 10 \$ 190 c/c. (06 NO) DISTRI 10 \$ 190 c/c. (05 NO)	200 X 390 200 X 300	8 12 6 12	8MM@150c/cDO
C - 35,36,39,40	1.75 X 2.00	0.860	MAIN 10 0 120 c/c (16 NO) DISTRI 10 0 120 c/c (14 NO)	300 X 530	8 16 6 16	8MM@150chDO

SLR-FM-77 Set S


B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of only IS 1893 is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- The S-waves (secondary or shear waves) travel through 1)
 - b) Both solids and fluids

b) Landslides due to earthquake

d) Flood caused by earthquake

Gases

- a) Solids only c) Fluids only
- 2) Out of the many effects of earthquakes, IS-1893-2002 addresses only

d)

- a) Liquefaction of the soil strata
- c) Inertia forces on Structure
- 3) Acceleration response spectrum is a plot of _____.
 - a) Ground acceleration versus time
 - b) Response acceleration, versus time
 - Response acceleration versus natural period c)
 - d) Ground acceleration versus natural period
- In which of the following cases, the dynamic system has no oscillation but 4) returns to equillibrium at a slower rate? Over-damped case
 - a) Critically damped case
 - b) c) Under-damped case
- 5) The damping in a dynamic system is represented as equivalent to _____.
 - a) Coulomb damping b) Viscous damping
 - c) Friction damping d) Negative damping
- The importance factor for a Railway station building is _____. 6)
 - 1 b) 1.25 a) c) 1.5
- The zone factor for zone III is _____ 7)
 - b) 0.36 a) 0.16 c) 0.24 d) 0.10



2 d)



Marks: 14

SLR-FM-78



Max. Marks: 70

Set

14

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 & Q. No. 6 are compulsory and Solve any two questions from Each section.

- 2) Use of only IS 1893 is allowed.
- 3) Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Discuss briefly the two measures of an earthquake.
- Q.3 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain complete solution of differential equation and plot graph of magnification factor vs frequency ratio 'r'.
- Q.4 What do you mean by force transmissibility? Derive an expression for force 09 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- **Q.5** What is combined spectrum? What are its characteristics?

Section – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear in both direction of building. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.2m & Live load is 2.5 kN/m² IS 13920 will be used. The strata is Medium.



- Q.7 What do understand by a weak storey? How weak storey differs from soft storey?
- **Q.8** What do you understand by ductility and what is its importance?
- **Q.9** Explain the strengthening arrangements for masonry construction.

09

09

09



Max. Marks: 56

09

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of only IS 1893 is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- In which of the following cases, the dynamic system has no oscillation but 1) returns to equillibrium at a slower rate? b) Over-damped case
 - a) Critically damped case
 - c) Under-damped case
- d) Undamped case
- 2) The damping in a dynamic system is represented as equivalent to _____. b) Viscous damping
 - a) Coulomb damping c) Friction damping
- d) Negative damping
- The importance factor for a Railway station building is _____. 3)
 - a) 1 b) 1.25 c) 1.5 d) 2
- 4) The zone factor for zone III is _____
 - b) 0.36 a) 0.16
 - c) 0.24 d) 0.10
- The S-waves (secondary or shear waves) travel through _ 5) Solids only a)
 - b) Both solids and fluids
 - c) Fluids only d) Gases
- Out of the many effects of earthquakes, IS-1893-2002 addresses only 6)
 - Liquefaction of the soil strata a)
 - c) Inertia forces on Structure
- b) Landslides due to earthquake d) Flood caused by earthquake
- 7) Acceleration response spectrum is a plot of _____.
 - a) Ground acceleration versus time
 - b) Response acceleration, versus time
 - c) Response acceleration versus natural period
 - d) Ground acceleration versus natural period

SLR-FM-78



Marks: 14

Max. Marks: 70

Set

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 & Q. No. 6 are compulsory and Solve any two questions from Each section.

- 2) Use of only IS 1893 is allowed.
- 3) Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Discuss briefly the two measures of an earthquake.
- Q.3 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain complete solution of differential equation and plot graph of magnification factor vs frequency ratio 'r'.
- Q.4 What do you mean by force transmissibility? Derive an expression for force 09 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- **Q.5** What is combined spectrum? What are its characteristics?

Section – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear in both direction of building. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.2m & Live load is 2.5 kN/m² IS 13920 will be used. The strata is Medium.



09

09

09

- Q.7 What do understand by a weak storey? How weak storey differs from soft storey?
- **Q.8** What do you understand by ductility and what is its importance?
- **Q.9** Explain the strengthening arrangements for masonry construction.

Max. Marks: 56

09

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to right indicate full marks.
- 3) Use of only IS 1893 is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

2)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- The importance factor for a Railway station building is _____. 1)
 - 1 1.25 a) b) c) 1.5 2 d)
 - The zone factor for zone III is _____ b) 0.36 a) 0.16
 - c) 0.24 d) 0.10

The S-waves (secondary or shear waves) travel through _____ 3)

- a) Solids only b) Both solids and fluids
- c) Fluids only d) Gases
- 4) Out of the many effects of earthquakes, IS-1893-2002 addresses only
 - a) Liquefaction of the soil strata b) Landslides due to earthquake d) Flood caused by earthquake
 - c) Inertia forces on Structure
- 5) Acceleration response spectrum is a plot of _____.
 - Ground acceleration versus time a)
 - b) Response acceleration, versus time
 - c) Response acceleration versus natural period
 - d) Ground acceleration versus natural period
- 6) In which of the following cases, the dynamic system has no oscillation but returns to equillibrium at a slower rate?
 - a) Critically damped case b) Over-damped case
 - c) Under-damped case d) Undamped case
- 7) The damping in a dynamic system is represented as equivalent to _____.
 - a) Coulomb damping c) Friction damping
- b) Viscous damping Negative damping
- d)

SLR-FM-78



Max. Marks: 70

Marks: 14

Set

R

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 & Q. No. 6 are compulsory and Solve any two questions from Each section.

- 2) Use of only IS 1893 is allowed.
- 3) Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Discuss briefly the two measures of an earthquake.
- Q.3 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain complete solution of differential equation and plot graph of magnification factor vs frequency ratio 'r'.
- Q.4 What do you mean by force transmissibility? Derive an expression for force 09 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- Q.5 What is combined spectrum? What are its characteristics?

Section – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear in both direction of building. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.2m & Live load is 2.5 kN/m² IS 13920 will be used. The strata is Medium.



- Q.7 What do understand by a weak storey? How weak storey differs from soft storey?
- **Q.8** What do you understand by ductility and what is its importance?
- **Q.9** Explain the strengthening arrangements for masonry construction.

Max. Marks: 56

09

09

09

09

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

EARTHQUAKE ENGINEERING

- 2) Figures to right indicate full marks.
- 3) Use of only IS 1893 is allowed.
- 4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Out of the many effects of earthquakes, IS-1893-2002 addresses only 1)
 - Liquefaction of the soil strata a)
 - b) Landslides due to earthquake d) Flood caused by earthquake
 - c) Inertia forces on Structure
- 2) Acceleration response spectrum is a plot of _____.
 - a) Ground acceleration versus time
 - b) Response acceleration, versus time
 - c) Response acceleration versus natural period
 - d) Ground acceleration versus natural period
- 3) In which of the following cases, the dynamic system has no oscillation but returns to equillibrium at a slower rate?
 - a) Critically damped case b)
 - Over-damped case d) Undamped case
 - c) Under-damped case
- The damping in a dynamic system is represented as equivalent to _____. 4) b) Viscous damping
 - a) Coulomb damping

a) 1

- c) Friction damping d) Negative damping
- The importance factor for a Railway station building is _____. 5)
 - b) 1.25
 - c) 1.5 d) 2
- The zone factor for zone III is _____ 6)
 - b) 0.36 a) 0.16 c) 0.24 d) 0.10
- The S-waves (secondary or shear waves) travel through 7)
 - a) Solids only
- d) Gases

c) Fluids only

b) Both solids and fluids

SLR-FM-78

Max. Marks: 70

Marks: 14

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering EARTHQUAKE ENGINEERING

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 3 & Q. No. 6 are compulsory and Solve any two questions from Each section.

- 2) Use of only IS 1893 is allowed.
- 3) Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Discuss briefly the two measures of an earthquake.
- Q.3 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain complete solution of differential equation and plot graph of magnification factor vs frequency ratio 'r'.
- Q.4 What do you mean by force transmissibility? Derive an expression for force 09 transmissibility to the foundation of a SDOF system subjected to harmonic force.
- **Q.5** What is combined spectrum? What are its characteristics?

Section – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in fig.1 in zone III with following data. Determine the lateral forces and base shear in both direction of building. The all column sizes are 300 × 450 mm & beams sizes are 230 x 450 mm. The slab thickness is 120mm & thk. of walls is 230mm. The ht. of floor is 3.2m & Live load is 2.5 kN/m² IS 13920 will be used. The strata is Medium.



- Q.7 What do understand by a weak storey? How weak storey differs from soft storey?
- **Q.8** What do you understand by ductility and what is its importance?
- **Q.9** Explain the strengthening arrangements for masonry construction.

09

09

09



Max. Marks: 56

09

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- As the height of a proposed dam is increased, the cost per unit of storage: _____.
 - a) Increases
 - b) Decreases
 - c) Initially increases and then decreases
 - d) None of these

2) Transverse joints in concrete gravity dams are the _____.

- a) horizontal construction joints at each lift height
- b) vertical construction joints full of height and width
- c) diagonal construction joints for torsion
- d) none of the above
- 3) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam, is _____.
 - a) highly impervious clay b) highly pervious gravel
 - c) coarse sand d) clay mixed with fine sand
- 4) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the _____.
 - a) upstream slope b) downstream slope
 - c) both (a) and (b) d) none of these
- 5) The uplift pressure at the face of a drainage gallery in a gravity dam, is taken as equal to _____.
 - a) hydrostatic pressure at the toe
 - b) average of hydrostatic pressure at the toe and heel
 - c) two third of the hydrostatic pressure at the toe plus one third of the hydrostatic pressure at the heel
 - d) none of the above
- 6) The most economical type of arch dam in general is of _____
 - a) constant radius type
- b) variable radius type
- c) constant angle type d) none of these

Set

Max. Marks: 70

Marks: 14

Set

- crested weir, then theoretically _____.
 a) the pressure on the spillway crest will always be zero. (i.e. atmospheric pressure)
- b) the pressure on the spillway crest will be zero at design head only.

When the crest of an ogee spillway is designed to be in accordance with the lower nappe of a free falling water jet over a duly ventilated sharp

- c) the pressure on the spillway crest will always be negative.
- d) the pressure on the spillway crest will always be positive.
- 8) If the operating head on an ogee spillway is more than the design head, then _____.
 - a) the pressure on the spillway crest will be zero.
 - b) the pressure on the spillway crest will be negative, causing cavitation.
 - c) the pressure on the spillway crest will be positive.
 - d) the discharge coefficient of the spillway will be reduced.
- 9) Bar screens, used to cover dam outlets to prevent entry of debris or ice into the sluiceway conduits, are called _____.
 - a) gate controlled ports
- b) projecting collarsd) none of these
- 10) Which one of the followings does not contribute to water logging?
 - a) inadequate drainage
 - b) seepage from unlined canals
 - c) frequent flooding

c) trash racks

7)

- d) excessive tapping of ground water
- 11) The free-board in lined canals is measured between _____.
 - a) FSL and top of lining
 - b) FSL and top of canal bank
 - c) top of lining and top of canal bank
 - d) none of them
- 12) The alkali salt, which is most injurious to plant growth, is _____
 - a) sodium carbonate b) sodium chloride
 - c) sodium sulphate
- d) sodium nitrate
- 13) The most commonly used vertical lift gates in modern days is _____.
 - a) sliding gates b) free roller gates
 - c) stoney gates d) fixed wheel gates
- 14) The only statement, which is incorrect in regard to hydropower, is _____.
 - a) the system efficiency of a hydro-plant is quite high
 - b) the installation cost of a hydro-plant is very high
 - c) the running cost of a hydro power plant is very low
 - d) the hydraulic turbines takes a lot of time in being put off and on

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Assume suitable data if necessary but mention it clearly.
- 4) Figures to the right indicate full marks.

Section – I

- Q.2 a) Discuss the process of reservoir sedimentation. Show with a neat sketch, deposition of various grain sizes of sediments along the reservoir bed.
 - b) Annual runoff in terms of depth over the catchment are of 1965 sq km
 05 of a reservoir is given below.

Year	1962	1963	1964	1965	1966	1967	1968	1969
Runoff	98	143.5	168.3	94	95.3	152.4	110	131.3
cm depth								

Draw the flow mass diagram. What is average yield of the catchment? What should be the live storage capacity of the reservoir to use the source fully? If the dead storage is 20% of live storage, what should be the gross storage?

- **Q.3 a)** What do you understand by a 'Gravity dam'? Explain the major forces **05** acting on a gravity dam.
 - b) Draw and discuss typical the energy dissipation arrangements on the downstream side of ogee spillway in form of a hydraulic jump.
- Q.4 a) What do you mean by a 'Phreatic line' in Earthen dam? Draw a typical 05 flow net showing seepage of water through 'Homogeneous embankment' type earth dam. State the formula for calculating seepage in this case.
 - b) Enumerate two different methods which are adopted for construction of earthen dam. Which of these methods you will prefer and why?
- Q.5 a) Draw a cross section of a 'Radial spillway gate'. Why these gates are preferred over Vertical lift gates?
 - b) A saddle siphon has the following data: Full reservoir level=435.00 m, U
 Level of centre of siphon outlet=429.60, Highest flood level=435.85 m, Highest flood discharge=600 cumec. If the dimensions of throat are: width = 4 m, Height = 2 m, determine the number of siphon units required to pass the flood safely. The siphon discharges freely in air.

Max. Marks: 56

Set P

SLR-FM-79 Set P

Section – II

Q.6	a)	Draw a neat sectional view of a weir showing the various parts. What is exit gradient? How does it affect the design of a weir?												05		
	b)	What do you mean by river training? Explain, High water, low water and mean water training.											nd	04		
Q.7	a) b)	Write a What i you ac	Write a detailed note on Financial justification for lining new canals'.0What is meant by 'saline' and 'alkaline' soils? What precautions will0you adopt to prevent salinity of irrigated land?											05 04		
Q.8	a)	State (followi 1) S 2)	State under what circumstances you will recommend the use of the 0 following cross drainage structures: 1) Syphon. 2) Aqueduct										05			
	b)	 Explain: How do the following assist in River Training: Guide bunds. Repelling grovenes. 										04				
Q.9	a)	Compa to esta	are 'T Iblishi	herm ment	al po	wer p	lants	and '	Hydro	opov / and	ver Pla	ants' v	with re	espec	ted ts	05
	b)	to establishment costs, operation, efficiency and environmental aspects. The water turbines at a 'Hydro-electric Storage Plant' produce 7360 kW of power when working under net head of 30 m. And with overall efficiency 80%. The inflow in reservoir in Million Cubic Meter (MCM)											05			
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct			
		90	80	73	80	70	98	120	80	96	105	100	75			
		Find [.]														

Find:

- The minimum reservoir capacity required to satisfy the uniform 1) demand of water.

2) The quantity of water wasted during the year.Assume reservoir to be full at the beginning of November. Use analytical method.

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- If the operating head on an ogee spillway is more than the design head, then _____.
 - a) the pressure on the spillway crest will be zero.
 - b) the pressure on the spillway crest will be negative, causing cavitation.
 - c) the pressure on the spillway crest will be positive.
 - d) the discharge coefficient of the spillway will be reduced.
- Bar screens, used to cover dam outlets to prevent entry of debris or ice into the sluiceway conduits, are called _____.
 - a) gate controlled portsc) trash racks
 - b) projecting collars d) none of these
- 3) Which one of the followings does not contribute to water logging?
 - a) inadequate drainage
 - b) seepage from unlined canals
 - c) frequent flooding
 - d) excessive tapping of ground water
- 4) The free-board in lined canals is measured between _____.
 - a) FSL and top of lining
 - b) FSL and top of canal bank
 - c) top of lining and top of canal bank
 - d) none of them

5) The alkali salt, which is most injurious to plant growth, is _____

- a) sodium carbonate b) sodium chloride
- c) sodium sulphate d) sodium nitrate
- 6) The most commonly used vertical lift gates in modern days is _____.
 - a) sliding gates b) free roller gates
 - c) stoney gates d) fixed wheel gates
- 7) The only statement, which is incorrect in regard to hydropower, is _____.
 - a) the system efficiency of a hydro-plant is quite high
 - b) the installation cost of a hydro-plant is very high
 - c) the running cost of a hydro power plant is very low
 - d) the hydraulic turbines takes a lot of time in being put off and on

Max. Marks: 70

Marks: 14

- a) Increases
- b) Decreases
- c) Initially increases and then decreases
- d) None of these
- 9) Transverse joints in concrete gravity dams are the _____.
 - horizontal construction joints at each lift height a)
 - b) vertical construction joints full of height and width
 - c) diagonal construction joints for torsion
 - d) none of the above
- 10) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam, is ____
 - highly impervious clay a)
- highly pervious gravel b)

Set Q

- c) coarse sand d) clay mixed with fine sand
- 11) When the water level standing against an earthen embankment, suddenly falls down, then there is an imminent risk of sliding failure, to the downstream slope
 - a) upstream slope b) c) both (a) and (b)
 - d) none of these
- The uplift pressure at the face of a drainage gallery in a gravity dam, is 12) taken as equal to .
 - a) hydrostatic pressure at the toe
 - b) average of hydrostatic pressure at the toe and heel
 - c) two third of the hydrostatic pressure at the toe plus one third of the hydrostatic pressure at the heel
 - d) none of the above
- The most economical type of arch dam in general is of _____ 13)
 - a) constant radius type b) variable radius type
 - c) constant angle type none of these d)
- When the crest of an ogee spillway is designed to be in accordance with 14) the lower nappe of a free falling water jet over a duly ventilated sharp crested weir, then theoretically _
 - a) the pressure on the spillway crest will always be zero. (i.e. atmospheric pressure)
 - b) the pressure on the spillway crest will be zero at design head only.
 - c) the pressure on the spillway crest will always be negative.
 - d) the pressure on the spillway crest will always be positive.

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Assume suitable data if necessary but mention it clearly.
- 4) Figures to the right indicate full marks.

Section – I

- Q.2 a) Discuss the process of reservoir sedimentation. Show with a neat sketch, deposition of various grain sizes of sediments along the reservoir bed.
 - b) Annual runoff in terms of depth over the catchment are of 1965 sq km
 05 of a reservoir is given below.

Year	1962	1963	1964	1965	1966	1967	1968	1969
Runoff	98	143.5	168.3	94	95.3	152.4	110	131.3
cm depth								

Draw the flow mass diagram. What is average yield of the catchment? What should be the live storage capacity of the reservoir to use the source fully? If the dead storage is 20% of live storage, what should be the gross storage?

- **Q.3 a)** What do you understand by a 'Gravity dam'? Explain the major forces **05** acting on a gravity dam.
 - b) Draw and discuss typical the energy dissipation arrangements on the downstream side of ogee spillway in form of a hydraulic jump.
- Q.4 a) What do you mean by a 'Phreatic line' in Earthen dam? Draw a typical 05 flow net showing seepage of water through 'Homogeneous embankment' type earth dam. State the formula for calculating seepage in this case.
 - b) Enumerate two different methods which are adopted for construction of earthen dam. Which of these methods you will prefer and why?
- Q.5 a) Draw a cross section of a 'Radial spillway gate'. Why these gates are preferred over Vertical lift gates?
 - b) A saddle siphon has the following data: Full reservoir level=435.00 m, U
 Level of centre of siphon outlet=429.60, Highest flood level=435.85 m, Highest flood discharge=600 cumec. If the dimensions of throat are: width = 4 m, Height = 2 m, determine the number of siphon units required to pass the flood safely. The siphon discharges freely in air.

Max. Marks: 56

Set Q

SLR-FM-79 Set Q

Section – II

Q.6	a)	Draw a	Draw a neat sectional view of a weir showing the various parts. What is exit gradient? How does it affect the design of a weir?												05	
	b)	What do you mean by river training? Explain, High water, low water and mean water training.											nd	04		
Q.7	a) b)	Write a What i you ad	Write a detailed note on Financial justification for lining new canals'.0What is meant by 'saline' and 'alkaline' soils? What precautions will0you adopt to prevent salinity of irrigated land?											05 04		
Q.8	a)	State u followin 1) S 2)	State under what circumstances you will recommend the use of the 0 following cross drainage structures: 1) Syphon.										05			
	b)	 Explain: How do the following assist in River Training: Guide bunds. Repelling grovenes. 										04				
Q.9	a)	Compa to esta	are 'T blishi	herm ment	al po	wer p	lants	and ' effic	Hydro	opov / anc	ver Pla Lenvii	ants' v	vith re	espec	ted	05
	b)	The wa of pow efficier during	to establishment costs, operation, efficiency and environmental aspects. The water turbines at a 'Hydro-electric Storage Plant' produce 7360 kW of power when working under net head of 30 m. And with overall efficiency 80%. The inflow in reservoir in Million Cubic Meter (MCM)											05		
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct			
		90	80	73	80	70	98	120	80	96	105	100	75			
		Find [.]														

Find:

- The minimum reservoir capacity required to satisfy the uniform 1) demand of water.

2) The quantity of water wasted during the year.Assume reservoir to be full at the beginning of November. Use analytical method.

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- The uplift pressure at the face of a drainage gallery in a gravity dam, is taken as equal to _____.
 - a) hydrostatic pressure at the toe
 - b) average of hydrostatic pressure at the toe and heel
 - c) two third of the hydrostatic pressure at the toe plus one third of the hydrostatic pressure at the heel
 - d) none of the above
- 2) The most economical type of arch dam in general is of _____
 - a) constant radius type b) variable radius type
 - c) constant angle type d) none of these
- 3) When the crest of an ogee spillway is designed to be in accordance with the lower nappe of a free falling water jet over a duly ventilated sharp crested weir, then theoretically _____.
 - a) the pressure on the spillway crest will always be zero. (i.e. atmospheric pressure)
 - b) the pressure on the spillway crest will be zero at design head only.
 - c) the pressure on the spillway crest will always be negative.
 - d) the pressure on the spillway crest will always be positive.
- 4) If the operating head on an ogee spillway is more than the design head, then _____.
 - a) the pressure on the spillway crest will be zero.
 - b) the pressure on the spillway crest will be negative, causing cavitation.
 - c) the pressure on the spillway crest will be positive.
 - d) the discharge coefficient of the spillway will be reduced.
- 5) Bar screens, used to cover dam outlets to prevent entry of debris or ice into the sluiceway conduits, are called _____.
 - a) gate controlled portsc) trash racks
- b) projecting collarsd) none of these
- 6) Which one of the followings does not contribute to water logging?
 - a) inadequate drainage
 - b) seepage from unlined canals
 - c) frequent flooding
 - d) excessive tapping of ground water

Max. Marks: 70

Marks: 14

14

R

	SLR-	ΗM	-79	
	8	Set	R	
7)	 The free-board in lined canals is measured between a) FSL and top of lining b) FSL and top of canal bank c) top of lining and top of canal bank d) none of them 			
8)	The alkali salt, which is most injurious to plant growth, isa) sodium carbonateb) sodium chloridec) sodium sulphated) sodium nitrate			
9)	The most commonly used vertical lift gates in modern days isa) sliding gatesb) free roller gatesc) stoney gatesd) fixed wheel gates			
10)	 The only statement, which is incorrect in regard to hydropower, is a) the system efficiency of a hydro-plant is quite high b) the installation cost of a hydro-plant is very high c) the running cost of a hydro power plant is very low d) the hydraulic turbines takes a lot of time in being put off and on 			
11)	 As the height of a proposed dam is increased, the cost per unit of storage: a) Increases b) Decreases c) Initially increases and then decreases d) None of these 			
12)	 Transverse joints in concrete gravity dams are the a) horizontal construction joints at each lift height b) vertical construction joints full of height and width c) diagonal construction joints for torsion d) none of the above 			
13)	The most preferred soil for the central impervious core of a zonedembankment type of an earthen dam, isa) highly impervious clayb) highly pervious gravelc) coarse sandd) clay mixed with fine sand			
14)	When the water level standing against an earthen embankment, sudd falls down, then there is an imminent risk of sliding failure, to thea) upstream slopeb) downstream slope	enly 		

- c) both (a) and (b)
- d) none of these

_

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 9 are compulsory.

- 2) Solve any two questions from each section.
- 3) Assume suitable data if necessary but mention it clearly.
- 4) Figures to the right indicate full marks.

Section – I

- Q.2 a) Discuss the process of reservoir sedimentation. Show with a neat sketch, deposition of various grain sizes of sediments along the reservoir bed.
 - b) Annual runoff in terms of depth over the catchment are of 1965 sq km
 05 of a reservoir is given below.

Year	1962	1963	1964	1965	1966	1967	1968	1969
Runoff	98	143.5	168.3	94	95.3	152.4	110	131.3
cm depth								

Draw the flow mass diagram. What is average yield of the catchment? What should be the live storage capacity of the reservoir to use the source fully? If the dead storage is 20% of live storage, what should be the gross storage?

- **Q.3 a)** What do you understand by a 'Gravity dam'? Explain the major forces **05** acting on a gravity dam.
 - b) Draw and discuss typical the energy dissipation arrangements on the downstream side of ogee spillway in form of a hydraulic jump.
- Q.4 a) What do you mean by a 'Phreatic line' in Earthen dam? Draw a typical 05 flow net showing seepage of water through 'Homogeneous embankment' type earth dam. State the formula for calculating seepage in this case.
 - b) Enumerate two different methods which are adopted for construction of earthen dam. Which of these methods you will prefer and why?
- Q.5 a) Draw a cross section of a 'Radial spillway gate'. Why these gates are preferred over Vertical lift gates?
 - b) A saddle siphon has the following data: Full reservoir level=435.00 m, U
 Level of centre of siphon outlet=429.60, Highest flood level=435.85 m, Highest flood discharge=600 cumec. If the dimensions of throat are: width = 4 m, Height = 2 m, determine the number of siphon units required to pass the flood safely. The siphon discharges freely in air.

Max. Marks: 56

Set R

SLR-FM-79 Set R

Section – II

Q.6	a)	Draw a	v a neat sectional view of a weir showing the various parts. What is 05 gradient? How does it affect the design of a weir?													
	b)	What of mean	do you water	u me train	an by ing.	river	traini	ing? E	xplai	n, Hi	gh wa	ater, Ic	w wa	ater and	04	4
Q.7	a) b)	Write a What i you ad	a deta s mea lopt to	ant by prev	note o y 'sali vent s	on Fir ne' ai salinit	nancia nd 'al y of ir	al justi kaline rrigate	ficatio ' soils d Ian	on fo s? W d?	r linin hat pi	g new recaut	cana ions v	als'. will	04 04	5 4
Q.8	a)	State u followi 1) S 2) A	tate under what circumstances you will recommend the use of the 0 blowing cross drainage structures:) Syphon.) Aqueduct.									5				
	b)	Explain 1) (2) F	n: Hov Guide Repel	w do buno ling g	the fo ds. groyei	ollowi nes.	ng as	sist in	Rive	er Tra	aining	:			04	4
Q.9	a)	Compa to esta	are 'T Iblishi	herm nent	al po costs	wer p s. ope	lants [®] ratior	' and ' n. effic	Hydro ienc\	opov / and	ver Pla d envii	ants' v ronme	vith re ntal a	espected aspects.	0	5
	b)	The wa	ater ti	urbin	es at	a 'Hy	dro-e	lectric	Stor	age	Planť	produ	ice 73	360 kW	0	5
		of pow	er wh		orkin	g unc	ler ne	t head	d of 3	0 m.	And	with o	verall			
		enciency 80%. The inflow in reservoir in Million Cubic Meter (MCM)														
		auring	a yea		Jiven	Delov	V.	14	L	L.I.	A	0 1	0-1			
		INOV	Dec	Jan	гер	war	Apr	way	Jun	Jul	Aug	Sept	Uct			
		90	80	73	80	70	98	120	80	96	105	100	75			
		Eliza al c														

Find:

- The minimum reservoir capacity required to satisfy the uniform 1) demand of water.

2) The quantity of water wasted during the year.Assume reservoir to be full at the beginning of November. Use analytical method.

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering WATER RESOURCES ENGINEERING – II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Assume suitable data if necessary but mention it clearly.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) Which one of the followings does not contribute to water logging?
 - a) inadequate drainage
 - b) seepage from unlined canals
 - c) frequent flooding
 - d) excessive tapping of ground water
- 2) The free-board in lined canals is measured between _____.
 - a) FSL and top of lining
 - b) FSL and top of canal bank
 - c) top of lining and top of canal bank
 - d) none of them

3) The alkali salt, which is most injurious to plant growth, is _____

- a) sodium carbonate b) sodium chloride
- c) sodium sulphate d) sodium nitrate
- 4) The most commonly used vertical lift gates in modern days is _____.
 - a) sliding gates b) free roller gates
 - c) stoney gates d) fixed wheel gates
- 5) The only statement, which is incorrect in regard to hydropower, is _____.
 - a) the system efficiency of a hydro-plant is quite high
 - b) the installation cost of a hydro-plant is very high
 - c) the running cost of a hydro power plant is very low
 - d) the hydraulic turbines takes a lot of time in being put off and on
- As the height of a proposed dam is increased, the cost per unit of storage: _____.
 - a) Increases
 - b) Decreases
 - c) Initially increases and then decreases
 - d) None of these
- 7) Transverse joints in concrete gravity dams are the _____.
 - a) horizontal construction joints at each lift height
 - b) vertical construction joints full of height and width
 - c) diagonal construction joints for torsion
 - d) none of the above



Max. Marks: 70

Marks: 14



- a) the pressure on the spillway crest will be zero.
- b) the pressure on the spillway crest will be negative, causing cavitation.
- c) the pressure on the spillway crest will be positive.
- d) the discharge coefficient of the spillway will be reduced.
- 14) Bar screens, used to cover dam outlets to prevent entry of debris or ice into the sluiceway conduits, are called _____.
 - a) gate controlled ports
- b) projecting collars

c) trash racks

d) none of these

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

WATER RESOURCES ENGINEERING - II

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 2 and Q. No. 9 are compulsory.

2) Solve any two questions from each section.

- 3) Assume suitable data if necessary but mention it clearly.
- 4) Figures to the right indicate full marks.

Section – I

- Q.2 a) Discuss the process of reservoir sedimentation. Show with a neat sketch, deposition of various grain sizes of sediments along the reservoir bed.
 - **b)** Annual runoff in terms of depth over the catchment are of 1965 sq km of a reservoir is given below.

05

Year	1962	1963	1964	1965	1966	1967	1968	1969
Runoff	98	143.5	168.3	94	95.3	152.4	110	131.3
cm depth								

Draw the flow mass diagram. What is average yield of the catchment? What should be the live storage capacity of the reservoir to use the source fully? If the dead storage is 20% of live storage, what should be the gross storage?

- **Q.3 a)** What do you understand by a 'Gravity dam'? Explain the major forces **05** acting on a gravity dam.
 - b) Draw and discuss typical the energy dissipation arrangements on the downstream side of ogee spillway in form of a hydraulic jump.
- Q.4 a) What do you mean by a 'Phreatic line' in Earthen dam? Draw a typical 05 flow net showing seepage of water through 'Homogeneous embankment' type earth dam. State the formula for calculating seepage in this case.
 - b) Enumerate two different methods which are adopted for construction of earthen dam. Which of these methods you will prefer and why?
- Q.5 a) Draw a cross section of a 'Radial spillway gate'. Why these gates are preferred over Vertical lift gates?
 - b) A saddle siphon has the following data: Full reservoir level=435.00 m, 04 Level of centre of siphon outlet=429.60, Highest flood level=435.85 m, Highest flood discharge=600 cumec. If the dimensions of throat are: width = 4 m, Height = 2 m, determine the number of siphon units required to pass the flood safely. The siphon discharges freely in air.

Seat No.



Max. Marks: 56

SLR-FM-79 Set S

Section – II

a)	Draw a exit gra	v a neat sectional view of a weir showing the various parts. What is 05 gradient? How does it affect the design of a weir?												
b)	What of mean	do you water	u me train	an by ing.	river	traini	ng? E	xplai	n, Hi	gh wa	ater, Ic	w wa	ater and	04
a) b)	Write a What i you ad	a deta s mea lopt to	ailed i ant by p prev	note o y 'sali vent s	on Fir ine' ai salinit	nancia nd 'al y of ir	al justi kaline rrigate	ficatio ' soils d Ian	on fo s? W d?	or linin ′hat p	ig new recaut	cana ions	als'. will	05 04
a)	State u followin 1) S 2) A	ate under what circumstances you will recommend the use of the 05 lowing cross drainage structures: Syphon. Aqueduct.									05			
b)	Explair 1) (2) F	n: Hov Guide Repel	w do buno ling g	the fo ds. groye	ollowi nes.	ng as	sist in	Rive	er Tra	aining	:			04
a)	Compa to esta	are 'T Iblishi	herm ment	al po costs	wer p s, ope	lants	' and ' n, effic	Hydro iency	opov / and	ver Pl d envi	ants' v ronme	with re ental a	espected aspects.	05
b)	The wa	ater tu	urbine	es at	a 'Hy	dro-e	lectric	Stor	age	Planť	produ	ice 73	360 kW	05
	of pow	er wh	nen w	orkin	g unc	ler ne	t head	d of 3	0 m.	And	with o	verall	I	
	efficier	ncy 80)%. T	he ir	flow i	n res	ervoir	in Mi	llion	Cubio	c Mete	er (MC	CM)	
	during a year is given below:													
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct		
	90	80	73	80	70	98	120	80	96	105	100	75		
	a) b) a) b) a) b)	 a) Draw a exit graves of power efficient during Nov 90 b) Draw a exit graves of exit graves o	 a) Draw a near exit gradient exit gradient with the your mean water a) Write a deta water a) Write a deta by What is mean water a) Write a deta you adopt to a you ad	 a) Draw a neat sect exit gradient? How with a do you mean water trainer and water trainer and write a detailed of What is mean to be what is meant by you adopt to previse a) State under what following cross of 1) Syphon. a) State under what following cross of 1) Syphon. b) Explain: How do 1) Guide bund 2) Repelling get and the stablishment to establishment to establishment be the water turbing of power when we efficiency 80%. The water is get Nov Dec Jan 90 80 73 	 a) Draw a neat sectional exit gradient? How do b) What do you mean by mean water training. a) Write a detailed note of What is meant by 'salidy you adopt to prevent sector following cross drainated 1) Syphon. a) State under what circulated following cross drainated 1) Syphon. b) Explain: How do the form 1) Guide bunds. c) Repelling groyeted 1) Guide bunds. d) Compare 'Thermal port to establishment costs b) The water turbines at of power when working efficiency 80%. The induring a year is given Nov Dec Jan Feb 90 80 73 80 	 a) Draw a neat sectional view exit gradient? How does it a What do you mean by river mean water training. a) Write a detailed note on Fir What is meant by 'saline' at you adopt to prevent salinit a) State under what circumstate following cross drainage struction 1) Syphon. 2) Aqueduct. b) Explain: How do the following 1) Guide bunds. 2) Repelling groyenes. a) Compare 'Thermal power protoestablishment costs, oper to establishment costs, oper to establishment costs, oper the water turbines at a 'Hy of power when working undeficiency 80%. The inflow in during a year is given below Nov Dec Jan Feb Mar 90 80 73 80 70 	 a) Draw a neat sectional view of a vexit gradient? How does it affect b) What do you mean by river training mean water training. a) Write a detailed note on Financia b) What is meant by 'saline' and 'al you adopt to prevent salinity of in a) State under what circumstances following cross drainage structure 1) Syphon. 2) Aqueduct. b) Explain: How do the following as 1) Guide bunds. 2) Repelling groyenes. a) Compare 'Thermal power plants to establishment costs, operation b) The water turbines at a 'Hydro-e of power when working under ne efficiency 80%. The inflow in residuring a year is given below: Nov Dec Jan Feb Mar Apr 90 80 73 80 70 98 	 a) Draw a neat sectional view of a weir she exit gradient? How does it affect the de What do you mean by river training? Emean water training. a) Write a detailed note on Financial justi What is meant by 'saline' and 'alkaline you adopt to prevent salinity of irrigate a) State under what circumstances you w following cross drainage structures: Syphon. Aqueduct. b) Explain: How do the following assist in 1) Guide bunds. Repelling groyenes. a) Compare 'Thermal power plants' and 'to establishment costs, operation, efficiency 80%. The inflow in reservoir during a year is given below: Nov Dec Jan Feb Mar Apr May 90 80 73 80 70 98 120 	 a) Draw a neat sectional view of a weir showir exit gradient? How does it affect the design What do you mean by river training? Explait mean water training. a) Write a detailed note on Financial justification What is meant by 'saline' and 'alkaline' soils you adopt to prevent salinity of irrigated lan a) State under what circumstances you will read following cross drainage structures: Syphon. Aqueduct. b) Explain: How do the following assist in River 1) Guide bunds. Repelling groyenes. a) Compare 'Thermal power plants' and 'Hydration establishment costs, operation, efficiency 50%. The inflow in reservoir in Miduring a year is given below: Nov Dec Jan Feb Mar Apr May Jun 90 80 73 80 70 98 120 80 	 a) Draw a neat sectional view of a weir showing th exit gradient? How does it affect the design of a b) What do you mean by river training? Explain, Himean water training. a) Write a detailed note on Financial justification for What is meant by 'saline' and 'alkaline' soils? Wyou adopt to prevent salinity of irrigated land? a) State under what circumstances you will recomm following cross drainage structures: 1) Syphon. 2) Aqueduct. b) Explain: How do the following assist in River Trating Guide bunds. 2) Repelling groyenes. a) Compare 'Thermal power plants' and 'Hydropow to establishment costs, operation, efficiency and the water turbines at a 'Hydro-electric Storage of power when working under net head of 30 m. efficiency 80%. The inflow in reservoir in Million during a year is given below: Nov Dec Jan Feb Mar Apr May Jun Jul 90 80 73 80 70 98 120 80 96 	 a) Draw a neat sectional view of a weir showing the variexit gradient? How does it affect the design of a weir? b) What do you mean by river training? Explain, High ware mean water training. a) Write a detailed note on Financial justification for linin What is meant by 'saline' and 'alkaline' soils? What pryou adopt to prevent salinity of irrigated land? a) State under what circumstances you will recommend following cross drainage structures: Syphon. Aqueduct. b) Explain: How do the following assist in River Training 1) Guide bunds. Repelling groyenes. a) Compare 'Thermal power plants' and 'Hydropower Pl to establishment costs, operation, efficiency and envi of power when working under net head of 30 m. And efficiency 80%. The inflow in reservoir in Million Cubic during a year is given below: Nov Dec Jan Feb Mar Apr May Jun Jul Aug 90 80 73 80 70 98 120 80 96 105 	 a) Draw a neat sectional view of a weir showing the various parexit gradient? How does it affect the design of a weir? b) What do you mean by river training? Explain, High water, low mean water training. a) Write a detailed note on Financial justification for lining new What is meant by 'saline' and 'alkaline' soils? What precaute you adopt to prevent salinity of irrigated land? a) State under what circumstances you will recommend the use following cross drainage structures: Syphon. Aqueduct. b) Explain: How do the following assist in River Training: Guide bunds. Repelling groyenes. a) Compare 'Thermal power plants' and 'Hydropower Plants' we to establishment costs, operation, efficiency and environment of power when working under net head of 30 m. And with o efficiency 80%. The inflow in reservoir in Million Cubic Meter during a year is given below: Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sept 90 80 73 80 70 98 120 80 96 105 100 	 a) Draw a neat sectional view of a weir showing the various parts. A exit gradient? How does it affect the design of a weir? b) What do you mean by river training? Explain, High water, low wa mean water training. a) Write a detailed note on Financial justification for lining new cars. What is meant by 'saline' and 'alkaline' soils? What precautions you adopt to prevent salinity of irrigated land? a) State under what circumstances you will recommend the use of following cross drainage structures: Syphon. Aqueduct. b) Explain: How do the following assist in River Training: Guide bunds. Repelling groyenes. a) Compare 'Thermal power plants' and 'Hydropower Plants' with r to establishment costs, operation, efficiency and environmental a efficiency 80%. The inflow in reservoir in Million Cubic Meter (Moduring a year is given below: Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sept Oct 90 80 73 80 70 98 120 80 96 105 100 75 	 a) Draw a neat sectional view of a weir showing the various parts. What is exit gradient? How does it affect the design of a weir? b) What do you mean by river training? Explain, High water, low water and mean water training. a) Write a detailed note on Financial justification for lining new canals'. b) What is meant by 'saline' and 'alkaline' soils? What precautions will you adopt to prevent salinity of irrigated land? a) State under what circumstances you will recommend the use of the following cross drainage structures: Syphon. Aqueduct. b) Explain: How do the following assist in River Training: Guide bunds. Repelling groyenes. a) Compare 'Thermal power plants' and 'Hydropower Plants' with respected to establishment costs, operation, efficiency and environmental aspects. b) The water turbines at a 'Hydro-electric Storage Plant' produce 7360 kW of power when working under net head of 30 m. And with overall efficiency 80%. The inflow in reservoir in Million Cubic Meter (MCM) during a year is given below: Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sept Oct 90 80 73 80 70 98 120 80 96 105 100 75

Find:

- 1) The minimum reservoir capacity required to satisfy the uniform demand of water.
- 2) The quantity of water wasted during the year.

Assume reservoir to be full at the beginning of November. Use analytical method.

Seat No.

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering OPEN CHANNEL AND RIVER HYDRAULICS**

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer Book.

- 2) Draw neat sketches wherever necessary.
- 3) Use of non programmable calculator is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes

3)

Q.1 Choose the correct alternatives from the options.

The flow in open channel may be characterized as laminar when 1)

b)

d)

Bed slope

- a) Re <500
 - Re >2000 b) c) Re >4000 d) 500 <Re >2000
- 2) The strength of 'Hydraulic Jump' is governed by the _ Up stream Froude's number
 - a) Up stream velocity
 - c) Down stream velocity
 - For the trapezoidal section
 - a) Shape is of half hexagon
 - b) Depth of flow equal to half bed width
 - c) Side slope equal to 45°
 - d) None
- 4) The maximum velocity in open channel occurs at _____.
 - Little below the free surface At the free surface b) a) None
 - c) Near the channel bottom d)

The momentum correction factor, β is given as 5)

- a) $1/V^2 A V^3 . dA$ 1/V AV.dA b)
- \dot{c}) $1/V^3 AV^2 dA$ $1/V^2 AV^2.dA$ d)

6) The mean velocity in Lacey's regime channel is proportional to .

- a) R^{2/3} c) $S_0^{1/2}$
- 7) Shield's diagram is a plot of non dimensional shear stress τc against ____.
 - Relative depth a) b)
 - c) Hydraulic radius d)
- Extreme condition of meanders is called as 8)
 - Spurs a) Leavee b)
 - c) Cut-off d) Island
- The size of sediment particles that will just remain at rest in bed of wide 9) rectangular channel equal to _____ . 10.8 D^{2/3}S₀^{1/3}
 - a) 11DS₀ b)
 - c) 11 $R^{1/2}S_0^{1/2}$ d) None

SLR-FM-80

Max. Marks: 70



Marks: 14

- - $R^{\frac{1}{2}}$ b)
 - $S_0^{1/3}$ d)

 - Shear Reynold's number
 - Reynold's number

				SLR	-FM-	·80
					Set	Ρ
10)	Kin a) c)	ematic similarity between model a Discharge Shape	and p b) d)	rototype is the similarity of Streamline pattern None		
11)	The inde a) c)	e Lacey's equation for a regime cl ependent equation relating to flov 1 5	hanne v, whe b) d)	el consist of a set of x' ere 'x' is equal to 3 8		
12)	Riv a) b) c) d)	er training work serves the follow Protect the river bed and banks Direct the river flow in desired co Increase or decrease of the rive Protect the surrounding land from	ing pu onditio r disc m floc	urposes on harge oding		
13)	Dis a) c)	torted models are required to be Rivers Dams across wide rivers	prepa b) d)	red for Harbors All		
14)	The a) c)	e dimension of Kinematic viscosity LT ⁻² L ³ T ⁻¹	y is b) d)	L ² T ⁻¹ LT ⁻¹		

12

SLR-FM-80

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL AND RIVER HYDRAULICS

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat sketches wherever necessary.
- 3) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any two.

- What do you understand by most economical channel section? And show that for trapezoidal section. Half of top width = length of one of sloping side and hydraulic mean depth = half the depth of flow.
- **b)** A flow of 5.0 m³/s is passing at a depth of 1.5 m through a rectangular channel of width 3.0 m, if α is 1.2 what is specific energy of flow? What is the value of the depth alternate to the existing depth if α = 1.0 (assumed for alternate flow).
- c) A rectangular channel has a bed width is 4.5 m; bottom slope is 0.0004 and mannings n = 0.020. The normal depth of flow in this channel is 2.0 m. If the channel empties into a pool at the down stream end and the pool elevation is 0.60 m higher than the canal bed elevation at the downstream end. Calculate the coordinates of the resulting GVF profile. (Take 2 steps only).

Q.3 Attempt any four.

- a) Derive the modified equation for GVF and also state the assumptions made for it.
- b) Define kinetic energy correction factor (α) and momentum correction factor(β).
- c) A 3.6 m wide rectangular channel conveys 10 m³/s of water with velocity of 6 m/s. Is there formation of Hydraulic Jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water?
- d) Find the rate of flow and conveyance 'K' for rectangular channel 6 m wide for uniform flow at a depth of 1.5 m. The bed slope of channel is 1:1000 and C = 50. Also slate that the flow is tranquil or rapid
- e) Derive the equation for energy loss through Hydraulic Jump starting from first principle.

Section – II

Q.4 Attempt any two.

- a) A 1:50 spillway model has discharge of 1.50 m³/sec. What is the corresponding prototype discharge if the flood phenomenon takes 12 hrs to occur in the prototype, how long should it take in model?
- **b)** Define similitude and state its types and derive Reynold's model law and state where it is used?

12

16

Max. Marks: 56

Set P

Set P

Draw a neat sketch of current meter and explain its working. And following C) velocities were recorded with current meter find discharge where the depth of flow is 5 m.

Depth above bed m	0	1	2	3	4
Velocity m/s	0	0.6	0.7	0.7	0.8

Q.5 Attempt any four.

- What is 'River Training Work' and explain its types? a)
- b) Write short note on:
 - 1) Levees.
 - 2) Cut-offs.
- Design an irrigation channel to carry 60 cumecs discharge. The channel is C) laid at a slope of 1/4500. The critical velocity ratio is 1.10. Use Kutters roughosity coefficient as 0.022.
- Oil of kinematic viscosity 4.5×10^{-5} m²/s is to be used in the prototype in d) which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:9 and find discharge ratio and time ratio for this model.
- e) Differentiate:
 - 1) Lacey's theory and Kennedy's theory



Day Time	& Date : 02:3	e: Tuesday, 17-12-2019 0 PM To 05:30 PM		Max. Marks: 70
Instr	uctio	 ns: 1) Q. No. 1 is compulsory. It shou Book. 2) Draw neat sketches wherever r 3) Use of non programmable calc 	ld be neces ulatoi	solved in first 30 minutes in answer sary. r is permitted.
D	1 O	MCQ/Objective Ty	vpe (Questions
Dura	uon: 3			Marks: 14
Q.1	Cho (1)	Extreme condition of meanders is ca a) Leavee c) Cut-off	e op alled a b) d)	as Spurs Island
	2)	The size of sediment particles that we rectangular channel equal to a) $11DS_0$ c) $11 R^{1/2}S_0^{1/2}$	vill jus b) d)	at remain at rest in bed of wide 10.8 D ^{2/3} S ₀ ^{1/3} None
	3)	Kinematic similarity between model a) Discharge c) Shape	and p b) d)	prototype is the similarity of Streamline pattern None
	4)	The Lacey's equation for a regime c independent equation relating to flow a) 1 c) 5	hann v, wh b) d)	el consist of a set of x' ere 'x' is equal to 3 8
	5)	 River training work serves the follow a) Protect the river bed and banks b) Direct the river flow in desired constraints c) Increase or decrease of the rive d) Protect the surrounding land from 	ing p onditi r disc m floo	urposes on harge oding
	6)	Distorted models are required to bea) Riversc) Dams across wide rivers	prepa b) d)	ared for Harbors All
	7)	The dimension of Kinematic viscosit	y is _	
	·	a) LT ⁻² c) L ³ T ⁻¹	b) d)	L ² T ⁻¹ LT ⁻¹
	8)	The flow in open channel may be ch a) Re <500 c) Re >4000	aract b) d)	erized as laminar when Re >2000 500 <re>2000</re>

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering OPEN CHANNEL AND RIVER HYDRAULICS

Seat No.

SLR-FM-80

Set Q

				Set	Q
9)	Th∉ a) c)	e strength of 'Hydraulic Jump' is g Up stream velocity Down stream velocity	overr b) d)	ed by the Up stream Froude's number Bed slope	
10)	For a) b) c) d)	the trapezoidal section Shape is of half hexagon Depth of flow equal to half bed w Side slope equal to 45° None	vidth		
11)	Th∈ a) c)	e maximum velocity in open chan Little below the free surface Near the channel bottom	nel oc b) d)	ccurs at At the free surface None	
12)	Th∈ a) c)	e momentum correction factor, β i 1/V ² AV ³ .dA 1/V ³ AV ² .dA	s give b) d)	en as 1/V AV.dA 1/V ² AV ² .dA	
13)	The a) c)	e mean velocity in Lacey's regime $R^{2/3}$ $S_0^{1/2}$	char b) d)	nel is proportional to R ^{$\frac{1}{2}S01/3$}	
14)	Shi a) c)	eld's diagram is a plot of non dim Relative depth Hydraulic radius	ensio b) d)	nal shear stress τc against Shear Reynold's number Reynold's number	

12

SLR-FM-80

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL AND RIVER HYDRAULICS

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat sketches wherever necessary.
- 3) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any two.

- What do you understand by most economical channel section? And show that for trapezoidal section. Half of top width = length of one of sloping side and hydraulic mean depth = half the depth of flow.
- **b)** A flow of 5.0 m³/s is passing at a depth of 1.5 m through a rectangular channel of width 3.0 m, if α is 1.2 what is specific energy of flow? What is the value of the depth alternate to the existing depth if α = 1.0 (assumed for alternate flow).
- c) A rectangular channel has a bed width is 4.5 m; bottom slope is 0.0004 and mannings n = 0.020. The normal depth of flow in this channel is 2.0 m. If the channel empties into a pool at the down stream end and the pool elevation is 0.60 m higher than the canal bed elevation at the downstream end. Calculate the coordinates of the resulting GVF profile. (Take 2 steps only).

Q.3 Attempt any four.

- a) Derive the modified equation for GVF and also state the assumptions made for it.
- b) Define kinetic energy correction factor (α) and momentum correction factor(β).
- c) A 3.6 m wide rectangular channel conveys 10 m³/s of water with velocity of 6 m/s. Is there formation of Hydraulic Jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water?
- d) Find the rate of flow and conveyance 'K' for rectangular channel 6 m wide for uniform flow at a depth of 1.5 m. The bed slope of channel is 1:1000 and C = 50. Also slate that the flow is tranquil or rapid
- e) Derive the equation for energy loss through Hydraulic Jump starting from first principle.

Section – II

Q.4 Attempt any two.

- a) A 1:50 spillway model has discharge of 1.50 m³/sec. What is the corresponding prototype discharge if the flood phenomenon takes 12 hrs to occur in the prototype, how long should it take in model?
- **b)** Define similitude and state its types and derive Reynold's model law and state where it is used?

Max. Marks: 56

16

c) Draw a neat sketch of current meter and explain its working. And following velocities were recorded with current meter find discharge where the depth of flow is 5 m.

Depth above bed m	0	1	2	3	4
Velocity m/s	0	0.6	0.7	0.7	0.8

Q.5 Attempt any four.

- a) What is 'River Training Work' and explain its types?
- **b**) Write short note on:
 - 1) Levees.

2) Cut-offs.

- c) Design an irrigation channel to carry 60 cumecs discharge. The channel is laid at a slope of 1/4500. The critical velocity ratio is 1.10. Use Kutters roughosity coefficient as 0.022.
- **d)** Oil of kinematic viscosity 4.5 x 10⁻⁵ m²/s is to be used in the prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:9 and find discharge ratio and time ratio for this model.
- e) Differentiate:
 - 1) Lacey's theory and Kennedy's theory



Set Q

No.						Set	R
	В.	E. (Part – I	(Old) (CGP) (Civil E	A) Exam ngineeri	ination Nov/Dec- ng	2019	
		OPEN C	CHANNEL AN	ND RIVE	RHYDRAULICS		
Day & Time: (Date: T 02:30 P	uesday, 17-12 M To 05:30 P	2-2019 M			Max. Marks	3: 70
Instru	ctions:	1) Q. No. 1 is Book.	compulsory. It	should be	solved in first 30 min	utes in answe	эr
		 Draw neat Use of non 	sketches where programmable	ever neces calculato	ssary. r is permitted.		
		Ν	ICQ/Objectiv	е Туре (Questions		
Duratio	on: 30 N	linutes				Marks	3: 14
Q.1 (Choose the correct alternatives from the options.						14
	a) c)	$1/V^2 AV^3.dA$ $1/V^3 AV^2.dA$		b), p is giv b) d)	1/V AV.dA 1/V ² AV ² .dA		
2	2) Th a) c)	he mean veloc $R^{2/3}$ $S_0^{1/2}$	tity in Lacey's re	egime chai b) d)	nnel is proportional to R ^{1⁄2} S ₀ ^{1/3})	
3	3) Sh a) c)	iield's diagran Relative de∣ Hydraulic ra	n is a plot of nor pth adius	n dimensio b) d)	onal shear stress τc a Shear Reynold's nu Reynold's number	igainst mber	
2	4) Ex a) c)	treme condition Leavee Cut-off	on of meanders	is called a b) d)	as Spurs Island		
Ę	5) Th rea a) c)	e size of sedi ctangular char 11DS ₀ 11 R ^{1/2} S ₀ ^{1/2}	ment particles t nnel equal to	hat will jus b) d)	t remain at rest in be 10.8 D ^{2/3} S ₀ ^{1/3} None	d of wide	
6	6) Kii a) c)	nematic simila Discharge Shape	arity between m	odel and p b) d)	prototype is the simila Streamline pattern None	rity of	
7	7) Th inc a) c)	e Lacey's equ lependent equ 1 5	uation for a reginuation relating to	me chann o flow, wh b) d)	el consist of a set of a ere 'x' is equal to 3 8	к' 	
8	8) Ri ^r a) b) c) d)	ver training wer Protect the Direct the ri Increase or Protect the	ork serves the for river bed and ba ver flow in desir decrease of the surrounding lan	ollowing p anks ed conditi river disc d from floo	urposes on harge oding		
ç	€) Di a)	storted model Rivers	s are required to	o be prepa b)	ared for Harbors		

d)

All

c) Dams across wide rivers

Seat

SLR-FM-80

Γ

Set R

- The dimension of Kinematic viscosity is _____. 10)
 - a) LT⁻² $L^{2} T^{-1}$ b) c) L³ T⁻¹ LT⁻¹ d)
- 11) The flow in open channel may be characterized as laminar when _____. a) Re <500
 - Re >2000 b)
 - c) Re >4000 d) 500 <Re >2000
- 12) The strength of 'Hydraulic Jump' is governed by the ____
 - a) Up stream velocity
- Up stream Froude's number b)
- c) Down stream velocity
- d) Bed slope
- 13) For the trapezoidal section ____
 - a) Shape is of half hexagon
 - Depth of flow equal to half bed width b)
 - c) Side slope equal to 45°
 - d) None
- 14) The maximum velocity in open channel occurs at _____.
 - a) Little below the free surface b) At the free surface

.

- c) Near the channel bottom
- d) None

12

SLR-FM-80

Seat	
No.	

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL AND RIVER HYDRAULICS

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat sketches wherever necessary.
- 3) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any two.

- a) What do you understand by most economical channel section? And show that for trapezoidal section. Half of top width = length of one of sloping side and hydraulic mean depth = half the depth of flow.
- **b)** A flow of 5.0 m³/s is passing at a depth of 1.5 m through a rectangular channel of width 3.0 m, if α is 1.2 what is specific energy of flow? What is the value of the depth alternate to the existing depth if α = 1.0 (assumed for alternate flow).
- c) A rectangular channel has a bed width is 4.5 m; bottom slope is 0.0004 and mannings n = 0.020. The normal depth of flow in this channel is 2.0 m. If the channel empties into a pool at the down stream end and the pool elevation is 0.60 m higher than the canal bed elevation at the downstream end. Calculate the coordinates of the resulting GVF profile. (Take 2 steps only).

Q.3 Attempt any four.

- a) Derive the modified equation for GVF and also state the assumptions made for it.
- b) Define kinetic energy correction factor (α) and momentum correction factor(β).
- c) A 3.6 m wide rectangular channel conveys 10 m³/s of water with velocity of 6 m/s. Is there formation of Hydraulic Jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water?
- d) Find the rate of flow and conveyance 'K' for rectangular channel 6 m wide for uniform flow at a depth of 1.5 m. The bed slope of channel is 1:1000 and C = 50. Also slate that the flow is tranquil or rapid
- e) Derive the equation for energy loss through Hydraulic Jump starting from first principle.

Section – II

Q.4 Attempt any two.

- a) A 1:50 spillway model has discharge of 1.50 m³/sec. What is the corresponding prototype discharge if the flood phenomenon takes 12 hrs to occur in the prototype, how long should it take in model?
- **b)** Define similitude and state its types and derive Reynold's model law and state where it is used?

12

16

Set R

Max. Marks: 56

Page **12** of **16**

c) Draw a neat sketch of current meter and explain its working. And following velocities were recorded with current meter find discharge where the depth of flow is 5 m.

Depth above bed m	0	1	2	3	4
Velocity m/s	0	0.6	0.7	0.7	0.8

Q.5 Attempt any four.

- a) What is 'River Training Work' and explain its types?
- **b)** Write short note on:
 - 1) Levees.

2) Cut-offs.

- c) Design an irrigation channel to carry 60 cumecs discharge. The channel is laid at a slope of 1/4500. The critical velocity ratio is 1.10. Use Kutters roughosity coefficient as 0.022.
- **d)** Oil of kinematic viscosity 4.5 x 10⁻⁵ m²/s is to be used in the prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:9 and find discharge ratio and time ratio for this model.
- e) Differentiate:
 - 1) Lacey's theory and Kennedy's theory



Set R
			MCQ/Objective	Гуре	Questions	
Dura	tion: 3	0 Mi	nutes			Marks
Q.1	Choo 1)	ose f Kin a) c)	t he correct alternatives from ematic similarity between mode Discharge Shape	t he op el and p b) d)	tions. prototype is the similarity of Streamline pattern None	
	2)	The inde a) c)	e Lacey's equation for a regime ependent equation relating to fl 1 5	chann ow, wh b) d)	el consist of a set of x' ere 'x' is equal to 3 8	
	3)	Riv a) b) c) d)	er training work serves the follo Protect the river bed and bank Direct the river flow in desired Increase or decrease of the riv Protect the surrounding land fi	owing p s conditi ver disc rom flo	ourposes ion charge oding	
	4)	Dis a) c)	torted models are required to b Rivers Dams across wide rivers	e prepa b) d)	ared for Harbors All	
	5)	The	e dimension of Kinematic viscos	sity is _	·	
		a) c)	LT ⁻² L ³ T ⁻¹	b) d)	L ² T ⁻¹ LT ⁻¹	
	6)	Th∉ a) c)	e flow in open channel may be o Re <500 Re >4000	charact b) d)	terized as laminar when Re >2000 500 <re>2000</re>	
	7)	The a) c)	e strength of 'Hydraulic Jump' is Up stream velocity Down stream velocity	s gover b) d)	ned by the Up stream Froude's numb Bed slope	er
	8)	For a) b) c)	the trapezoidal section Shape is of half hexagon Depth of flow equal to half bec Side slope equal to 45°	 I width		

- d) None
- 9) The maximum velocity in open channel occurs at _____ a) Little below the free surface
 - b) At the free surface None
 - c) Near the channel bottom d)

: 14

14

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer

S

Civil Engineering **OPEN CHANNEL AND RIVER HYDRAULICS**

2) Draw neat sketches wherever necessary.

3) Use of non programmable calculator is permitted.

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Tuesday, 17-12-2019

Book.

Time: 02:30 PM To 05:30 PM

Seat No.

SLR-FM-80

Set

Max. Marks: 70

				SLR-FM-80
				Set S
10)	The	e momentum correction factor, β	is give	en as
	a)	$1/V^2 AV^3.dA$	b)	1/V AV.dA
	c)	$1/V^3 AV^2.dA$	d)	1/V ² AV ² .dA
11)	The	e mean velocity in Lacey's regime	e char	nnel is proportional to
	a)	R ^{2/3}	b)	$R^{\frac{1}{2}}$
	c)	S ₀ ^{1/2}	d)	$S_0^{\frac{1}{3}}$
12)	Shie	eld's diagram is a plot of non dim	ensic	onal shear stress $ au c$ against
	a)	Relative depth	b)	Shear Reynold's number
	c)	Hydraulic radius	d)	Reynold's number
13)	Extr	reme condition of meanders is ca	alled a	as
	a)	Leavee	b)	Spurs
	c)	Cut-off	d)	Island
14)	The rect a)	e size of sediment particles that w angular channel equal to 11DS ₀	/ill jus b)	t remain at rest in bed of wide $10.8 \text{ D}^{2/3} \text{S}_0^{1/3}$

c) 11 $R^{1/2}S_0^{1/2}$

d) None

12

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering OPEN CHANNEL AND RIVER HYDRAULICS

Day & Date: Tuesday,17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat sketches wherever necessary.
- 3) Use of non programmable calculator is permitted.

Section – I

Q.2 Attempt any two.

- a) What do you understand by most economical channel section? And show that for trapezoidal section. Half of top width = length of one of sloping side and hydraulic mean depth = half the depth of flow.
- **b)** A flow of 5.0 m³/s is passing at a depth of 1.5 m through a rectangular channel of width 3.0 m, if α is 1.2 what is specific energy of flow? What is the value of the depth alternate to the existing depth if α = 1.0 (assumed for alternate flow).
- c) A rectangular channel has a bed width is 4.5 m; bottom slope is 0.0004 and mannings n = 0.020. The normal depth of flow in this channel is 2.0 m. If the channel empties into a pool at the down stream end and the pool elevation is 0.60 m higher than the canal bed elevation at the downstream end. Calculate the coordinates of the resulting GVF profile. (Take 2 steps only).

Q.3 Attempt any four.

- a) Derive the modified equation for GVF and also state the assumptions made for it.
- b) Define kinetic energy correction factor (α) and momentum correction factor(β).
- c) A 3.6 m wide rectangular channel conveys 10 m³/s of water with velocity of 6 m/s. Is there formation of Hydraulic Jump if yes calculate height, length and strength of Jump and what is loss of energy per kg of water?
- d) Find the rate of flow and conveyance 'K' for rectangular channel 6 m wide for uniform flow at a depth of 1.5 m. The bed slope of channel is 1:1000 and C = 50. Also slate that the flow is tranquil or rapid
- e) Derive the equation for energy loss through Hydraulic Jump starting from first principle.

Section – II

Q.4 Attempt any two.

- a) A 1:50 spillway model has discharge of 1.50 m³/sec. What is the corresponding prototype discharge if the flood phenomenon takes 12 hrs to occur in the prototype, how long should it take in model?
- **b)** Define similitude and state its types and derive Reynold's model law and state where it is used?

Max. Marks: 56

16

12



Seat No. c) Draw a neat sketch of current meter and explain its working. And following velocities were recorded with current meter find discharge where the depth of flow is 5 m.

Depth above bed m	0	1	2	3	4			
Velocity m/s	0	0.6	0.7	0.7	0.8			

Q.5 Attempt any four.

- a) What is 'River Training Work' and explain its types?
- **b)** Write short note on:
 - 1) Levees.

2) Cut-offs.

- c) Design an irrigation channel to carry 60 cumecs discharge. The channel is laid at a slope of 1/4500. The critical velocity ratio is 1.10. Use Kutters roughosity coefficient as 0.022.
- **d)** Oil of kinematic viscosity 4.5 x 10⁻⁵ m²/s is to be used in the prototype in which both gravity and viscous forces are important. What should be the viscosity of liquid used in dynamically similar model of scale 1:9 and find discharge ratio and time ratio for this model.
- e) Differentiate:
 - 1) Lacey's theory and Kennedy's theory





16

		wow/objective Type w	463110113
Dura	tion:	30 Minutes	Marks: 14
Q.1	Chc 1)	As per NAAQS (2009), air quality standard a) Eco-sensitive b) c) Industrial d)	tions. 14 ds are given for areas. Rural and urban All of above
	2)	Unit of measuring thickness of ozone is _ a) Hofmann unit b) c) Dobson unit d)	 Chapman unit Hudson unit
	3)	Which of the following is/are primary pollua)Ozoneb)b)c)Photo chemical Smogd)	tant? PAN CH₄
	4)	 Automobile pollution can be controlled by a) Use of catalytic convertors b) Reducing use of vehicle for shorter d c) Creating awareness in public d) Proper air to fuel ratio e) All of above 	 istance
	5)	Bags in bag house filter are m in lea) 2-10b)c) 2-12d)	ngth/height. 1-2 10-10
	6)	Pick out the o one: Superadiabatic, Subaca)Superadiabaticb)c)Subadiabaticd)	liabatic, inversion, Subsidence. Inversion subsidence
	7)	Injury/injuries to plant amongst following is a) Epinasty b) c) Abscission d)	s/are Chlorosis All of above
	8)	Hb in blood reacts with CO to forma) Carbon diaoxideb)c) PANd)	 Carboxy hemoglobein PBN

Day & Date: Tuesday, 17-12-2019

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

Civil Engineering

- 2) Assume suitable data whenever required.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **AIR POLLUTION & CONTROL**

Time: 02:30 PM To 05:30 PM

Seat No.



Set

Max. Marks: 70

Ρ

9) In Gaussian Dispersion Model down wind direction is considered along _ axis. a) Х b) y d) none of these C) z 10) Negative lapse rate is called as _____ b) DALR MMD a) Inversion d) Unstable condition C) The standard value of DALR is _____ 11) _. b) -1.9°C/100km -0.8°C/10km a) -9.8°C/km d) -10°C/1.5km C) High volume sampler or respirable dust sampler is used for _____. 12) Stack monitorsing Auto exhaust analysis a) b) ambient air quality monitoring All of above d) C) 13) Sick building syndrome is associated with _ a) Out door pollution Indoor pollution b) Space pollution d) Geothermal effect C) Molecular weight of ozone is _____ 14) 16 b) 32 a) 48 C) d) 64

SLR-FM-81

Set P

uj							
	Meteorologcal parameter	Unit of measurement	to measure the parameter	air pollution YES/NO			
	Wind speed						
	Relatie humidity						
	Atmospheric pressure						
	temperature						
b)	A thermal powerpl ash and 1% sulph	ant burns coalat a ur. Determine SP	a rate of 500 kg/hr M and SO ₂ emissi	. Coal contains 30% on ratesin gm/sec.			
a)	Give Gaussian dis concentration of a	persion model ec ir pollutants.	quation used for pro	ediction of			
b)	Convert. 1) $800 \ \mu\text{g/m}^3$ of SO ₂ in ppm at 30°C 2) $1200 \ \text{ppm}$ of H ₂ S in $\mu\text{g/m}^3$ at 27°C						
Wri	te short notes (An	y Three)					
a)	Air pollution episo	des					
b)	Heat island effect						
C)	Acid rain						
d)	Effects of air pollu	tants on materials	6				

Q.2 a) Explain structure of atmosphere with the help of neat sketch.

2) Solve any two questions from each section.

3) Use of non-programmable is allowed. 4) Figure to the right indicates full marks. 5) Assume suitable data whenever required.

- - Micro scale 1)
 - Meso scale 2)
- Q.3
- Macro scale

Section – I

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering AIR POLLUTION & CONTROL**

Explain with example. b)

Instructions: 1) Q.No.3 and Q.No.8 are compulsory.

- 3)

Page 3 of 16

Max. Marks: 56

SLR-FM-81

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Seat No.

Q.4

Q.5

06

03

Set

Set P

Section – II

Q.6	a) b)	 Define with neat sketch. 1) Over iso-kinetic sampling 2) Under iso-kinetic sampling 3) Iso-kinetic sampling Explain any two methods for determination of air pollution index. 	06 03
Q.7	a)	Explain working of ESP with neat sketch and along with advantages and disadvantages	04
	b)	Determine number of bags necessary to treat 16 m ³ /sec of pollutes air laden with particulates, Air to cloth ratio is 10 m/min. the bags have 0.25 m diameter and 7 m length.	05
Q.8	a)	Explain with neat sketch working of spray tower. Also give advantages and disadvantages	04
	b)	 Concentration of SPM was determined by using high volume sampler. Determine the concentration of SPM in µg/m³ for following data. 1) Actual sampling time (T) = 24 hrs. 2) Average flow rate (Q_{avg}) = 1.45 cu. M/min 3) Initial weight of filter(w₂) = 10.280 gm 4) Final weight of filter(w₁) = 9.789 gm (Note — No need to apply correction for volume) 	06
Q.9	Wri a) b) c) d)	te short notes. (Any Three) Gravity settling chamber with tray Automobile pollution Indoor pollution Photochemical smog	09

Day Time	& Date : 02:3	e: Tu 0 PN	esday, 17-12-2019 1 To 05:30 PM		Max. Marks: 70
Instr	uctio	n s: 1 2 3 4) Q. No. 1 is compulsory and sho book.) Assume suitable data whenever) Figures to the right indicate full r) Use of non-programmable calculation 	ould b requ narks lator	be solved in first 30 minutes in answer ired. S. is allowed.
			MCQ/Objective Ty	pe Q	uestions
Dura	ition: 3	80 Mi	nutes		Marks: 14
Q.1	Cho	ose	the correct alternatives from th	e opt	ions. 14
	1)	Hb i a) c)	n blood reacts with CO to form Carbon diaoxide PAN	b) d)	 Carboxy hemoglobein PBN
	2)	In G	aussian Dispersion Model down	wind	direction is considered along
		a) c)	axis. x z	b) d)	y none of these
	3)	Neg a) c)	ative lapse rate is called as MMD Inversion	b) d)	DALR Unstable condition
	4)	The a) c)	standard value of DALR is -0.8°C/10km -9.8°C/km	 b) d)	-1.9°C/100km -10°C/1.5km
	5)	Higł a) c)	n volume sampler or respirable du Stack monitorsing ambient air quality monitoring	ist sa b) d)	mpler is used for Auto exhaust analysis All of above
	6)	Sick a) c)	building syndrome is associated Out door pollution Space pollution	with b) d)	Indoor pollution Geothermal effect
	7)	Mol a) c)	ecular weight of ozone is 16 48	b) d)	32 64
	8)	As p a) c)	per NAAQS (2009), air quality stat Eco-sensitive Industrial	ndarc b) d)	ls are given for areas. Rural and urban All of above
	9)	Unit a) c)	of measuring thickness of ozone Hofmann unit Dobson unit	is b) d)	 Chapman unit Hudson unit

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering AIR POLLUTION & CONTROL

Seat

No.

SLR-FM-81

Set | Q

SLR-FM-81 Set Q

- 10) Which of the following is/are primary pollutant?
 - Ozone b) PAN a)
 - Photo chemical Smog d) C) CH_4
- 11) Automobile pollution can be controlled by _____.
 - a) Use of catalytic convertors
 - Reducing use of vehicle for shorter distance b)
 - Creating awareness in public C)
 - Proper air to fuel ratio d)
 - All of above e)
- 12) Bags in bag house filter are _____ m in length/height.
 - a) 2-10 1-2 b)
 - c) 2-12 d) 10-10

Pick out the o one: Superadiabatic, Subadiabatic, inversion, Subsidence. 13)

- Superadiabatic Inversion b) a) c)
 - Subadiabatic d) subsidence
- 14) Injury/injuries to plant amongst following is/are ____
 - a) Epinasty

Chlorosis b)

c) Abscission d) All of above

Section – I 02 a) Explain structure of atmosphere with the help of neat sketch. 06 b) Explain with example. 03 1) Micro scale 03 2) Meso scale 03 3) Macro scale 04 Q.3 a) Complete the remaining columns of the following table. 04 Meteorologcal Unit of parameter measurement measure the parameter YES/NO 04 Wind speed 04 Relatie humidity 04 Atmospheric pressure 04 temperature 05 b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO ₂ emission ratesin gm/sec. 05 Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. 04 b) Convert. 04 1) 800 µg/m ³ of SO ₂ in ppm at 30°C 04 2) 1200 ppm of H ₂ S in µg/m ³ at 27°C 04 a) Air pollution episodes 09 a) Air pollution episodes 09 b) Heat island effect 09 c) Acid rain 09		ucin	2) Solve any t 3) Use of non 4) Figure to th 5) Assume su	wo questions from programmable is right indicates f itable data whene	n each section. allowed. ull marks. ever required.			
Q.2 a) Explain structure of atmosphere with the help of neat sketch. 06 b) Explain with example. 03 1) Micro scale 03 2) Meso scale 03 3) Macro scale 04 Q.3 a) Complete the remaining columns of the following table. 04 Meteorologcal parameter Unit of measurement to measure the parameter Contributing to air pollution YES/NO Wind speed Image: Contributing to air pollution yessure Contributing to air pollution yessure 04 Relatie humidity Image: Contributing to air pollution yessure Contributing to air pollution yessure 04 Atmospheric pressure Image: Contributing to air pollution yessure 04 04 Atmospheric pressure Image: Contributing to air pollution yessure 04 b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO ₂ emission ratesin gm/sec. 05 Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. 04 b) Convert. 04 04 04 1) 800 µg/m³ of SO ₂ in ppm at 30°C				Section	on – I			
 Q.3 a) Complete the remaining columns of the following table. Meteorologcal Unit of measurement Instrument used Contributing to air pollution YES/NO Wind speed Relatie humidity Atmospheric pressure temperature b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO₂ emission ratesin gm/sec. Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. b) Convert. b) Rou µg/m³ of SO₂ in ppm at 30°C c) 1200 ppm of H₂S in µg/m³ at 27°C Q.5 Write short notes. (Any Three) a) Air pollution episodes b) Heat island effect c) Acid rain 	Q.2	 a) Explain structure of atmosphere with the help of neat sketch. b) Explain with example. 1) Micro scale 2) Meso scale 3) Macro scale 						
Meteorologcal parameter Unit of measurement Instrument used to measure the parameter Contributing to air pollution YES/NO Wind speed	Q.3	a)	Complete the rem	aining columns of	the following table	Э.	04	
Wind speed Image: Constraint of the system Relatie humidity Image: Constraint of the system Atmospheric Image: Constraint of the system pressure Image: Constraint of the system temperature Image: Constraint of the system b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO2 emission rates in gm/sec. 06 Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. 05 b) Convert. 04 1) 800 µg/m³ of SO2 in ppm at 30°C 04 1) 800 µg/m³ of SO2 in ppm at 30°C 04 04 04 2) 1200 ppm of H2S in µg/m³ at 27°C 09 09 a) Air pollution episodes 09 09 b) Heat island effect 09 09			Meteorologcal parameter	Unit of measurement	Instrument used to measure the parameter	Contributing to air pollution YES/NO		
Relatie humidity			Wind speed		•			
Atmospheric pressure pressure description temperature description description b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO ₂ emission ratesin gm/sec. 06 Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. 05 b) Convert. 04 1) 800 µg/m³ of SO ₂ in ppm at 30°C 2) 1200 ppm of H ₂ S in µg/m³ at 27°C Q.5 Write short notes. (Any Three) 09 a) Air pollution episodes 09 b) Heat island effect c) Acid rain			Relatie humidity					
 temperature b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO₂ emission ratesin gm/sec. Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. b) Convert. 1) 800 µg/m³ of SO₂ in ppm at 30°C 2) 1200 ppm of H₂S in µg/m³ at 27°C Q.5 Write short notes. (Any Three) a) Air pollution episodes b) Heat island effect c) Acid rain 			Atmospheric pressure					
 b) A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO₂ emission ratesin gm/sec. Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. b) Convert. 1) 800 µg/m³ of SO₂ in ppm at 30°C 2) 1200 ppm of H₂S in µg/m³ at 27°C Q.5 Write short notes. (Any Three) a) Air pollution episodes b) Heat island effect c) Acid rain 			temperature					
 Q.4 a) Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. b) Convert. 1) 800 μg/m³ of SO₂ in ppm at 30°C 2) 1200 ppm of H₂S in μg/m³ at 27°C Q.5 Write short notes. (Any Three) a) Air pollution episodes b) Heat island effect c) Acid rain 		b)	A thermal powerp ash and 1% sulph	lant burns coalat a ur. Determine SP	a rate of 500 kg/hr M and SO ₂ emissi	. Coal contains 30% on ratesin gm/sec.	06	
b) Convert. 04 1) $800 \ \mu g/m^3 \text{ of } SO_2 \text{ in } ppm \text{ at } 30^\circ C$ 2) $1200 \ ppm \text{ of } H_2 S \text{ in } \mu g/m^3 \text{ at } 27^\circ C$ Q.5 Write short notes. (Any Three) 09 a) Air pollution episodes b) Heat island effect c) Acid rain	Q.4	a)	Give Gaussian dispersion model equation used for prediction of concentration of air pollutants.					
 Q.5 Write short notes. (Any Three) a) Air pollution episodes b) Heat island effect c) Acid rain 		b)	Convert. 1) 800 µg/m ³ of 2) 1200 ppm of I	SO ₂ in ppm at 30 ^c H ₂ S in μ g/m ³ at 27	°C 7°C		04	
 a) Air pollution episodes b) Heat island effect c) Acid rain 	Q.5	Wri	ite short notes. (A	ny Three)			09	
 b) Heat island effect c) Acid rain 		a)	Air pollution episo	des				
C) ACIO FAIN		b)	Heat island effect					
d) Effects of air pollutants on materials		с) С)	ACID FAIN	tants on materials				

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q No 3 and Q No 8 are compulsory

Max. Marks: 56

Set Q

Set Q

Section – II

Q.6	a) b)	 Define with neat sketch. 1) Over iso-kinetic sampling 2) Under iso-kinetic sampling 3) Iso-kinetic sampling Explain any two methods for determination of air pollution index. 	06 03
Q.7	a)	Explain working of ESP with neat sketch and along with advantages and disadvantages	04
	b)	Determine number of bags necessary to treat 16 m ³ /sec of pollutes air laden with particulates, Air to cloth ratio is 10 m/min. the bags have 0.25 m diameter and 7 m length.	05
Q.8	a)	Explain with neat sketch working of spray tower. Also give advantages and disadvantages	04
	b)	 Concentration of SPM was determined by using high volume sampler. Determine the concentration of SPM in µg/m³ for following data. 1) Actual sampling time (T) = 24 hrs. 2) Average flow rate (Q_{avg}) = 1.45 cu. M/min 3) Initial weight of filter(w₂) = 10.280 gm 4) Final weight of filter(w₁) = 9.789 gm (Note — No need to apply correction for volume) 	06
Q.9	Wri a) b) c) d)	te short notes. (Any Three) Gravity settling chamber with tray Automobile pollution Indoor pollution Photochemical smog	09

		B.E	E. (Part – I) (Old) (CGPA) E Civil Engiı	xam neer	ination Nov/Dec-2019 ing
			AIR POLLUTION	& C	ONTROL
Day Time	& Dat e: 02:3	e: Tu 80 PN	iesday, 17-12-2019 / To 05:30 PM		Max. Marks: 70
Inst	ructio	ns: 1) Q. No. 1 is compulsory and sh	ould	be solved in first 30 minutes in answer
			book.		
		2) Assume suitable data wheneve	r req	uired.
		3) Figures to the right indicate full	mark	S.
		4			
			MCQ/Objective Ty	/pe C	luestions
Dura	ation: (30 Mi	inutes		Marks: 14
Q.1	Cho	ose	the correct alternatives from the	ne op	tions. 14
	1)	Bag	s in bag house filter are m	n in le	ngth/height.
		a)	2-10	b)	1-2
	-	C)	2-12	u)	
	2)	Pick	cout the oone: Superadiabatic, S	Subac	diabatic, inversion, Subsidence.
		a) c)	Subadiabatic	(d (b	subsidence
	2)	0) Iniu		u) Jing i	
	3)	inju a)	Foinasty	ving i: b)	Chlorosis
		c)	Abscission	d)	All of above
	4)	, Hh i	n blood reacts with CO to form	,	
	•,	a)	Carbon diaoxide	b)	 Carboxy hemoglobein
		c)	PAN	d)	PBN
	5)	In G	aussian Dispersion Model down axis.	wind	direction is considered along
		a)	x	b)	у
		c)	Z	d)	none of these
	6)	Neg	ative lapse rate is called as	•	
		a)	MMD	b)	DALR
		C)	Inversion	d)	Unstable condition
	7)	The	standard value of DALR is	<u> </u>	
		a)	-0.8°C/10km	b)	-1.9°C/100km
		C)	-9.8°C/Rm	a)	-10°C/1.5km
	8)	High	n volume sampler or respirable d	ust sa	ampler is used for
		a)	Stack monitorsing	d)	Auto exhaust analysis
	0)	0) 0:-1	a huilding our drame is a set if the	u) 1	
	9)	SICK	Out door pollution	a witn b)	 Indoor pollution
		c)	Space pollution	d)	Geothermal effect

Seat	
No.	

Set R

SLR-FM-81 Set R

- Molecular weight of ozone is _____. 10)
 - b) 32 a) 16 64
 - c) 48 d)

As per NAAQS (2009), air quality standards are given for _____ areas. 11)

- a) **Eco-sensitive** b) C) Industrial
- Rural and urban d) All of above

.

- 12) Unit of measuring thickness of ozone is _
 - Chapman unit b)
 - Hudson unit d)
- 13) Which of the following is/are primary pollutant?
 - PAN Ozone a) b)
 - Photo chemical Smog C) d) CH₄
- 14) Automobile pollution can be controlled by _____.
 - Use of catalytic convertors a)
 - Reducing use of vehicle for shorter distance b)
 - Creating awareness in public C)
 - Proper air to fuel ratio d)

Hofmann unit

Dobson unit

a)

C)

e) All of above

		4) Figure to th 5) Assume su	e right indicates f	ull marks. ver required.				
		,	Secti	on – I				
Q.2	a) b)	 Explain structure of atmosphere with the help of neat sketch. Explain with example. 1) Micro scale 2) Meso scale 3) Macro scale 						
Q.3	a)	Complete the rem	aining columns of	the following table	Э.	04		
		Meteorologcal parameter	Unit of measurement	Instrument used to measure the parameter	Contributing to air pollution YES/NO			
		Wind speed						
		Relatie humidity						
		Atmospheric pressure						
		temperature						
	b)	A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% ash and 1% sulphur. Determine SPM and SO ₂ emission ratesin gm/sec.						
Q.4	a)	Give Gaussian dispersion model equation used for prediction of concentration of air pollutants.						
	b)	Convert. 1) 800 μ g/m ³ of SO ₂ in ppm at 30°C 2) 1200 ppm of H ₂ S in μ g/m ³ at 27°C						
Q.5	Wri a) b) c)	te short notes. (A Air pollution episo Heat island effect Acid rain	ny Three) des			0		

d)	Effects of a	r pollutants on	materials
----	--------------	-----------------	-----------

Max. Marks: 56

Set R

Seat No.

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering AIR POLLUTION & CONTROL**

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.3 and Q.No.8 are compulsory.

- 2) Solve any two questions from each section.
- 2 1 loo of no n programmable is allowed
- C
- C

Set R

Section – II

Q.6	a) b)	 Define with neat sketch. 1) Over iso-kinetic sampling 2) Under iso-kinetic sampling 3) Iso-kinetic sampling Explain any two methods for determination of air pollution index. 	06 03
Q.7	a)	Explain working of ESP with neat sketch and along with advantages and disadvantages	04
	b)	Determine number of bags necessary to treat 16 m ³ /sec of pollutes air laden with particulates, Air to cloth ratio is 10 m/min. the bags have 0.25 m diameter and 7 m length.	05
Q.8	a)	Explain with neat sketch working of spray tower. Also give advantages and disadvantages	04
	b)	 Concentration of SPM was determined by using high volume sampler. Determine the concentration of SPM in µg/m³ for following data. 1) Actual sampling time (T) = 24 hrs. 2) Average flow rate (Q_{avg}) = 1.45 cu. M/min 3) Initial weight of filter(w₂) = 10.280 gm 4) Final weight of filter(w₁) = 9.789 gm (Note — No need to apply correction for volume) 	06
Q.9	Wri a) b) c) d)	te short notes. (Any Three) Gravity settling chamber with tray Automobile pollution Indoor pollution Photochemical smog	09

		AIR POLLUTION	l & C	ONTROL	
Day Time	& Dat e: 02:3	te: Tuesday, 17-12-2019 30 PM To 05:30 PM		Max. Marks:	70
Inst	ructio	ons: 1) Q. No. 1 is compulsory and st	ould	be solved in first 30 minutes in answ	ver
		2) Assume suitable data whenever3) Figures to the right indicate full4) Use of non-programmable calc	er requ mark ulator	uired. s. r is allowed.	
		MCQ/Objective T	ype Q	uestions	
Dura	ation: 3	30 Minutes		Marks:	14
Q.1	Cho 1)	bose the correct alternatives from t Negative lapse rate is called as	he op	tions.	14
	,	a) MMD c) Inversion	b) d)	DALR Unstable condition	
	2)	The standard value of DALR is a) -0.8°C/10km c) -9.8°C/km	 b) d)	-1.9°C/100km -10°C/1.5km	
	3)	High volume sampler or respirable ofa) Stack monitorsingc) ambient air quality monitoring	lust sa b) d)	ampler is used for Auto exhaust analysis All of above	
	4)	Sick building syndrome is associate a) Out door pollution c) Space pollution	d with b) d)	Indoor pollution Geothermal effect	
	5)	Molecular weight of ozone is a) 16 c) 48	 b) d)	32 64	
	6)	As per NAAQS (2009), air quality sta a) Eco-sensitive c) Industrial	andar b) d)	ds are given for areas. Rural and urban All of above	
	7)	Unit of measuring thickness of ozon a) Hofmann unit c) Dobson unit	e is _ b) d)	 Chapman unit Hudson unit	
	8)	Which of the following is/are primary a) Ozone c) Photo chemical Smog	v pollu b) d)	ltant? PAN CH₄	
	9)	 Automobile pollution can be controll a) Use of catalytic convertors b) Reducing use of vehicle for sho c) Creating awareness in public d) Proper air to fuel ratio 	ed by orter d	listance	

Seat No.

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

- Proper air to fuel ratio u)
- e) All of above

SLR-FM-81

Set S

10) Bags in bag house filter are _____ m in length/height.

- a) 2-10 1-2 b)
- c) 2-12 d) 10-10

11) Pick out the o one: Superadiabatic, Subadiabatic, inversion, Subsidence.

- a) Superadiabatic b) Subadiabatic c)
 - d) subsidence

Inversion

Injury/injuries to plant amongst following is/are _____. 12)

- Chlorosis a) Epinasty b) C)
 - Abscission d) All of above
- Hb in blood reacts with CO to form 13)
 - Carbon diaoxide b) Carboxy hemoglobein a) PAN d) C) PBN
- In Gaussian Dispersion Model down wind direction is considered along 14) _ axis.
 - a) b) Х y
 - c) Ζ d) none of these

SLR-FM-81

Set S

	B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec- Civil Engineering AIR POLLUTION & CONTROL	2019
Day & D	ate: Tuesday, 17-12-2019	Max. Marks: 56
Time: 0	2:30 PM To 05:30 PM	
Instruc	 ions: 1) Q.No.3 and Q.No.8 are compulsory. 2) Solve any two questions from each section. 3) Use of non-programmable is allowed. 4) Figure to the right indicates full marks. 5) Assume suitable data whenever required. 	
	Section – I	
Q.2 a) b)	 Explain structure of atmosphere with the help of neat sketch. Explain with example. 1) Micro scale 2) Meso scale 3) Macro scale 	06 03

Q.3 a) Complete the remaining columns of the following table.

Meteorologcal parameter	Unit of measurement	Instrument used to measure the parameter	Contributing to air pollution YES/NO
Wind speed			
Relatie humidity			
Atmospheric			
pressure			
temperature			

- **b)** A thermal powerplant burns coalat a rate of 500 kg/hr. Coal contains 30% 06 ash and 1% sulphur. Determine SPM and SO₂ emission ratesin gm/sec.
- Give Gaussian dispersion model equation used for prediction of Q.4 a) 05 concentration of air pollutants. Convert. b) 04 1) 800 μ g/m³ of SO₂ in ppm at 30°C
 - 2) 1200 ppm of H₂S in μ g/m³ at 27°C

Q.5 Write short notes. (Any Three)

- Air pollution episodes a)
- b) Heat island effect
- c) Acid rain
- d) Effects of air pollutants on materials

Seat No.

04

09

Page 15 of 16



SLR-FM-81

Set S

Section – II

Q.6	a) b)	 Define with neat sketch. 1) Over iso-kinetic sampling 2) Under iso-kinetic sampling 3) Iso-kinetic sampling Explain any two methods for determination of air pollution index. 	06 03
Q.7	a)	Explain working of ESP with neat sketch and along with advantages and disadvantages	04
	b)	Determine number of bags necessary to treat 16 m ³ /sec of pollutes air laden with particulates, Air to cloth ratio is 10 m/min. the bags have 0.25 m diameter and 7 m length.	05
Q.8	a)	Explain with neat sketch working of spray tower. Also give advantages and disadvantages	04
	b)	 Concentration of SPM was determined by using high volume sampler. Determine the concentration of SPM in µg/m³ for following data. 1) Actual sampling time (T) = 24 hrs. 2) Average flow rate (Q_{avg}) = 1.45 cu. M/min 3) Initial weight of filter(w₂) = 10.280 gm 4) Final weight of filter(w₁) = 9.789 gm (Note — No need to apply correction for volume) 	06
Q.9	Wri a) b) c) d)	te short notes. (Any Three) Gravity settling chamber with tray Automobile pollution Indoor pollution Photochemical smog	09

E	B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
	Civil Engineering
	DESIGN OF FOUNDATIONS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- The negative skin friction on pile develops when _____. 1)
 - a) The soil in which it is driven in sandy soil
 - b) The surrounding soil settles more than pile
 - c) The ground water table rises
 - d) The soil near the tip is clay
- The seismic refraction method cannot be need if the wave velocity in the 2) lower layer is _____ that in the upper layer.
 - a) Greater than b) Less than
 - c) More than 4 times d) Less than 4 times
- 3) The bearing capacity of soil supporting a footing of size 1.5m x 1.5m will not be affected by the presence of water table located at a depth _____ below base of footing. b) 1.0m
 - a) 0.5m
 - c) 1.5m d) 2.0m
- Gross and net bearing capacities will be the same when the structure is 4) founded at At a depth 2m below GL

b)

- a) Ground Level
- c) At a depth 4m below GL d)
- 5) In case of sandy soil settlement is predominant.
 - a) Immediate settlement
 - b) Consolidation settlement
 - c) Secondary consolidation settlement
 - d) Both b & c
- 6) When the area of all the footings covers more than 50% of the area of the structure, which foundation is considered more suitable? b) Pile
 - a) Raft
 - c) Caisson d)
- 7) The floating caisson is _____
 - a) Open at top closed at bottom
 - c) open at top and bottom both
- b) closed at top open at bottom
- none of the above d)

Well Foundation

It is not possible

Max. Marks: 70

Set

Marks: 14

14

8)	In under reamed pile construction, the ratio of shaft diameter to bulb
	diameter is

- a) 1/1.5 b) 1/2
- 1/2.5 d) 1/4 c)
- 9) During the process of well sinking, in order to overcome skin friction and loss in weight of the well due to buoyancy, the term that is applied is ____.
 - a) Kentiledge b) Bed rock c) Cutting edge
 - d) Steining

Set

10) With increase in the size of footing the bearing capacity of footing on clay

d)

Increases a)

b) Decreases

None of these

- c) Remains same
- 11) In case of Well Foundation, grip length is defined as the _____.
 - a) Length below the top of well cap to the cutting edge
 - b) Length between bottom of the well cap to the cutting edge
 - c) Length between minimum scour level and bottom of the well
 - d) Length between maximum scour level and bottom of the well
- The scour depth as per Lacey's formulae is given by 12)
 - 0.573(Q/f)^{1/3} $0.473(Q/f)^{1/3}$ a) b)
 - c) 0.673(Q/f)^{1/3} d) 0.773(Q/f)^{1/3}
- 13) When the frequency of the exciting force in a forced vibration of a body or a system equals one of the natural frequencies of the body or system, the amplitude of motion tends to become excessively large. This condition or phenomenon is called
 - Resonance a)

- b) Damping
- **Free Vibration** Negative damping d) C)
- 14) When the allowable soil pressure is low and expected differential settlement for spread footing is high, the best choice is _____ foundation.
 - Raft a)
- Trapezoidal b)

Rectangular c)

None of the above d)

Set

Max. Marks: 56

03

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q. No. 4 & Q. No. 8 is compulsory. Attempt any two questions from remaining questions from each sections.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data and mention it clearly.

Section – I

Q.2	a)	a) Discuss the depth of explorations necessary for various types of	
		foundations.	
	b)	Explain Geophysical Exploration with neat sketches.	06

- Explain Geophysical Exploration with neat sketches. b)
- Q.3 a) Explain various types of shear failure of soil?
 - A strip footing 2 m wide carries a load intensity of 400 kN/m² at a depth of b) 06 1.2 m in sand. The saturated unit weight of sand is 19.5 kN/m³ and unit weight above water table is 16.8 kn/m³. The shear strength parameters are c = 0 and $\Phi = 35^{\circ}$. Determine F.O.S w.r.t shear failure for the water table 4 m below G.L. Use Terzaghi's equation.
- Explain in which situation raft foundation is needed? What are the IS Code Q.4 04 a) provision for it?
 - As per IS code rigid method analysis, analyze and find the maximum 06 b) stresses at the corners of the Raft foundation shown below in fig 1. All columns are in square shape of size 400 x 400 mm.



Fig. 1

		SLR-FM-	82
		Set	Ρ
Q.5	a) b)	Discuss the characteristics of Black Cotton soil. Boussinesq equation for vertical stress distribution.	03 06
		Section – II	
Q.6	a)	Explain types of piles with neat sketch.	03
	b)	A group of 9 piles with 3 piles in row were driven into a soft clay extending from ground level up to a great depth. The dia and the length of piles were 30 cm and 10 m respectively. The unconfined compressive strength of the clay is 70 kpa. If the piles are placed at 90 cm c/c, compute the allowable load on the pile group on the of shear failure criteria. Take factor of safety = 2.5 For $\phi u = 0$, Nc = 9.	06
Q.7	a) b)	Explain Pneumatic caisson with neat sketch. What are the various components of well foundation? Explain the design of individual component of the Well Foundation.	03 06
Q.8	a) b)	Resonance occurs at a frequency of 20 cps in vertical vibration of a test block 1m x 1m x 1m. Calculate the coefficient of elastic uniform compression. Draw the sketch of block foundation with all 6 degrees of freedom?	06 04
		(3 translation and 3 rotation)	
Q.9	Writ a) b) c) d)	e short notes on any three Methods of Underpinning Box caisson Pile cap Vibration absorbers	09

e) Criteria for satisfaction performance of machine foundation

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer Book.

Civil Engineering DESIGN OF FOUNDATIONS

- 2) Figures to the right indicate full marks.
- 3) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

In under reamed pile construction, the ratio of shaft diameter to bulb 1) diameter is _____.

a)	1/1.5	b)	1⁄2
c)	1/2.5	d)	1⁄4

- 2) During the process of well sinking, in order to overcome skin friction and loss in weight of the well due to buoyancy, the term that is applied is ____.
 - a) Kentiledge Bed rock b)
 - c) Cutting edge d) Steining
- 3) With increase in the size of footing the bearing capacity of footing on clay
 - Increases b) a)
 - c) Remains same
- Decreases d) None of these
- 4) In case of Well Foundation, grip length is defined as the _____.
 - a) Length below the top of well cap to the cutting edge
 - b) Length between bottom of the well cap to the cutting edge
 - c) Length between minimum scour level and bottom of the well
 - d) Length between maximum scour level and bottom of the well
- The scour depth as per Lacey's formulae is given by 5) $Q/f)^{1/3}$

a)	0.473(Q/f) ^{1/3}	b)	0.573(Q/f) ^{1/3}
c)	0.673(Q/f) ^{1/3}	d)	0.773(Q/f) ^{1/3}

- c) $0.673(Q/f)^{1/3}$
- When the frequency of the exciting force in a forced vibration of a body or 6) a system equals one of the natural frequencies of the body or system, the amplitude of motion tends to become excessively large. This condition or phenomenon is called _____.
 - a) Resonance b) Damping Free Vibration
 - c) Negative damping d)
- 7) When the allowable soil pressure is low and expected differential settlement for spread footing is high, the best choice is _____ foundation. Raft Trapezoidal a) b)
 - c) Rectangular d) None of the above

Set

Max. Marks: 70

SLR-FM-82

Marks: 14

14

- The negative skin friction on pile develops when .
- a) The soil in which it is driven in sandy soil
- b) The surrounding soil settles more than pile
- The ground water table rises c)
- d) The soil near the tip is clay
- 9) The seismic refraction method cannot be need if the wave velocity in the lower layer is _____ that in the upper layer.
 - a) Greater than Less than b)
 - c) More than 4 times d) Less than 4 times
- 10) The bearing capacity of soil supporting a footing of size 1.5m x 1.5m will not be affected by the presence of water table located at a depth _____ below base of footing. 1.0m

b)

a) 0.5m

8)

- c) 1.5m d) 2.0m
- Gross and net bearing capacities will be the same when the structure is 11) founded at
 - a) Ground Level c) At a depth 4m below GL
- b) At a depth 2m below GL

SLR-FM-82

Set

- d) It is not possible
- In case of sandy soil settlement is predominant. 12)
 - a) Immediate settlement
 - b) Consolidation settlement
 - c) Secondary consolidation settlement
 - d) Both b & c
- When the area of all the footings covers more than 50% of the area of the 13) structure, which foundation is considered more suitable?
 - a) Raft c) Caisson
- Pile b) Well Foundation d)
- 14) The floating caisson is
 - a) Open at top closed at bottom
 - c) open at top and bottom both
- b) closed at top open at bottom
- d) none of the above

Set

03

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q. No. 4 & Q. No. 8 is compulsory. Attempt any two questions from remaining questions from each sections.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data and mention it clearly.

Section – I

Q.2	a)	Discuss the depth of explorations necessary for various types of	03
		foundations.	
	b)	Explain Geophysical Exploration with neat sketches.	06

- Explain Geophysical Exploration with neat sketches. b)
- Q.3 a) Explain various types of shear failure of soil?
 - A strip footing 2 m wide carries a load intensity of 400 kN/m² at a depth of b) 06 1.2 m in sand. The saturated unit weight of sand is 19.5 kN/m³ and unit weight above water table is 16.8 kn/m³. The shear strength parameters are c = 0 and $\Phi = 35^{\circ}$. Determine F.O.S w.r.t shear failure for the water table 4 m below G.L. Use Terzaghi's equation.
- Explain in which situation raft foundation is needed? What are the IS Code Q.4 04 a) provision for it?
 - As per IS code rigid method analysis, analyze and find the maximum 06 b) stresses at the corners of the Raft foundation shown below in fig 1. All columns are in square shape of size 400 x 400 mm.



Fig. 1

Max. Marks: 56

		SLR-FM-	82
		Set	Q
Q.5	a) b)	Discuss the characteristics of Black Cotton soil. Boussinesq equation for vertical stress distribution.	03 06
		Section – II	
Q.6	a)	Explain types of piles with neat sketch.	03
	b)	A group of 9 piles with 3 piles in row were driven into a soft clay extending from ground level up to a great depth. The dia and the length of piles were 30 cm and 10 m respectively. The unconfined compressive strength of the clay is 70 kpa. If the piles are placed at 90 cm c/c, compute the allowable load on the pile group on the of shear failure criteria. Take factor of safety = 2.5 For φ u = 0, Nc = 9.	06
Q.7	a) b)	Explain Pneumatic caisson with neat sketch. What are the various components of well foundation? Explain the design of individual component of the Well Foundation.	03 06
Q.8	a) b)	Resonance occurs at a frequency of 20 cps in vertical vibration of a test block 1m x 1m x 1m. Calculate the coefficient of elastic uniform compression. Draw the sketch of block foundation with all 6 degrees of freedom? (3 translation and 3 rotation)	06 04
Q.9	Writ a) b) c) d)	t e short notes on any three Methods of Underpinning Box caisson Pile cap Vibration absorbers	09

e) Criteria for satisfaction performance of machine foundation

Set

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

nstructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer
Book.

- 2) Figures to the right indicate full marks.
- Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- In case of sandy soil settlement is predominant. 1)
 - a) Immediate settlement
 - b) Consolidation settlement
 - c) Secondary consolidation settlement
 - d) Both b & c
- When the area of all the footings covers more than 50% of the area of the 2) structure, which foundation is considered more suitable?
 - a) Raft Pile c) Caisson
- 3) The floating caisson is ____
 - a) Open at top closed at bottom
 - open at top and bottom both d) c)
- In under reamed pile construction, the ratio of shaft diameter to bulb 4) diameter is _____.
 - a) 1/1.5 b) $\frac{1}{2}$
 - c) 1/2.5 d) 1/4
- 5) During the process of well sinking, in order to overcome skin friction and loss in weight of the well due to buoyancy, the term that is applied is _____.
 - a) Kentiledge Bed rock b)
 - c) Cutting edge d) Steining
- 6) With increase in the size of footing the bearing capacity of footing on clay
 - Increases a)
 - b) c) Remains same d) None of these
- 7) In case of Well Foundation, grip length is defined as the _
 - a) Length below the top of well cap to the cutting edge
 - b) Length between bottom of the well cap to the cutting edge
 - c) Length between minimum scour level and bottom of the well
 - d) Length between maximum scour level and bottom of the well

Marks: 14

14

- b)
- d) Well Foundation
- b) closed at top open at bottom
- none of the above

Seat No.

SLR-FM-82

Max. Marks: 70

Decreases

			SLR-FM-82
			Set R
8)	The scour depth as per Lacey's form a) $0.473(Q/f)^{1/3}$ c) $0.673(Q/f)^{1/3}$	nulae b) d)	is given by 0.573(Q/f) ^{1/3} 0.773(Q/f) ^{1/3}
9)	When the frequency of the exciting a system equals one of the natural f amplitude of motion tends to becom phenomenon is called a) Resonance	force f freque le exc b)	in a forced vibration of a body or encies of the body or system, the essively large. This condition or Damping Free Vibration
10)	 When the allowable soil pressure is settlement for spread footing is high a) Raft c) Rectangular 	low a i, the l b) d)	Ind expected differential best choice is foundation. Trapezoidal None of the above
11)	 The negative skin friction on pile de a) The soil in which it is driven in s b) The surrounding soil settles modeling c) The ground water table rises d) The soil near the tip is clay 	velop: sandy re tha	s when soil In pile
12)	The seismic refraction method cannot lower layer is that in the cannot a) Greater than c) More than 4 times	ot be upper b) d)	need if the wave velocity in the layer. Less than Less than 4 times
13)	The bearing capacity of soil support not be affected by the presence of v below base of footing. a) 0.5m c) 1.5m	ting a vater t b) d)	footing of size 1.5m x 1.5m will table located at a depth 1.0m 2.0m
14)	 Gross and net bearing capacities with founded at a) Ground Level c) At a depth 4m below GL 	b) d)	he same when the structure is At a depth 2m below GL It is not possible

Set

Max. Marks: 56

R

03

Seat No.

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 4 & Q. No. 8 is compulsory. Attempt any two questions from remaining questions from each sections.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data and mention it clearly.

Section – I

- Q.2 a) Discuss the depth of explorations necessary for various types of 03 foundations. 06
 - Explain Geophysical Exploration with neat sketches. b)

Q.3 a) Explain various types of shear failure of soil?

- A strip footing 2 m wide carries a load intensity of 400 kN/m² at a depth of 06 b) 1.2 m in sand. The saturated unit weight of sand is 19.5 kN/m³ and unit weight above water table is 16.8 kn/m³. The shear strength parameters are c = 0 and $\Phi = 35^{\circ}$. Determine F.O.S w.r.t shear failure for the water table 4 m below G.L. Use Terzaghi's equation.
- Q.4 Explain in which situation raft foundation is needed? What are the IS Code 04 a) provision for it?
 - As per IS code rigid method analysis, analyze and find the maximum 06 b) stresses at the corners of the Raft foundation shown below in fig 1. All columns are in square shape of size 400 x 400 mm.



		Set	R
Q.5	a) b)	Discuss the characteristics of Black Cotton soil. Boussinesq equation for vertical stress distribution.	03 06
		Section – II	
Q.6	a)	Explain types of piles with neat sketch.	03
	b)	A group of 9 piles with 3 piles in row were driven into a soft clay extending from ground level up to a great depth. The dia and the length of piles were 30 cm and 10 m respectively. The unconfined compressive strength of the clay is 70 kpa. If the piles are placed at 90 cm c/c, compute the allowable load on the pile group on the of shear failure criteria. Take factor of safety = 2.5 For $\phi u = 0$, Nc = 9.	06
Q.7	a) b)	Explain Pneumatic caisson with neat sketch. What are the various components of well foundation? Explain the design of individual component of the Well Foundation.	03 06
Q.8	a)	Resonance occurs at a frequency of 20 cps in vertical vibration of a test block 1m x 1m x 1m. Calculate the coefficient of elastic uniform compression.	06
	b)	Draw the sketch of block foundation with all 6 degrees of freedom? (3 translation and 3 rotation)	04
Q.9	Writ a) b) c) d)	te short notes on any three Methods of Underpinning Box caisson Pile cap Vibration absorbers	09

e) Criteria for satisfaction performance of machine foundation

Set

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF FOUNDATIONS

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in answer Book.
 - 2) Figures to the right indicate full marks.
 - 3) Assume additional data if required and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 1) With increase in the size of footing the bearing capacity of footing on clay
 - a) Increases

c) Remains same

- b) Decreases
- d) None of these
- 2) In case of Well Foundation, grip length is defined as the _____.
 - a) Length below the top of well cap to the cutting edge
 - b) Length between bottom of the well cap to the cutting edge
 - c) Length between minimum scour level and bottom of the well
 - d) Length between maximum scour level and bottom of the well
- 3) The scour depth as per Lacey's formulae is given by _____.
 - a) $0.473(Q/f)_{1/2}^{1/3}$ b) $0.573(Q/f)^{1/3}$
 - c) $0.673(Q/f)^{1/3}$ d) $0.773(Q/f)^{1/3}$
- 4) When the frequency of the exciting force in a forced vibration of a body or a system equals one of the natural frequencies of the body or system, the amplitude of motion tends to become excessively large. This condition or phenomenon is called _____.
 - a) Resonance

- b) Damping
- c) Negative damping d) Free Vibration

5) When the allowable soil pressure is low and expected differential settlement for spread footing is high, the best choice is _____ foundation.

- a) Raft b) Trapezoidal
- c) Rectangular d) None of the above
- 6) The negative skin friction on pile develops when _____.
 - a) The soil in which it is driven in sandy soil
 - b) The surrounding soil settles more than pile
 - c) The ground water table rises
 - d) The soil near the tip is clay
- 7) The seismic refraction method cannot be need if the wave velocity in the lower layer is ______ that in the upper layer.
 - a) Greater than b) Less than
 - c) More than 4 times d) Less than 4 times

)

Max. Marks: 70

Marks: 14

14

- 8) The bearing capacity of soil supporting a footing of size 1.5m x 1.5m will not be affected by the presence of water table located at a depth _____ below base of footing.
 - a) 0.5m b) 1.0m c) 1.5m d) 2.0m
- 9) Gross and net bearing capacities will be the same when the structure is founded at .
 - a) Ground Level
- At a depth 2m below GL b)
- c) At a depth 4m below GL It is not possible d)
- 10) In case of sandy soil _____ settlement is predominant.
 - a) Immediate settlement
 - b) Consolidation settlement
 - c) Secondary consolidation settlement
 - d) Both b & c
- When the area of all the footings covers more than 50% of the area of the 11) structure, which foundation is considered more suitable?
 - Raft b) Pile a)
 - c) Caisson d) Well Foundation
- The floating caisson is 12)
 - a) Open at top closed at bottom
 - c) open at top and bottom both
- b) closed at top open at bottom

none of the above

- d)
- In under reamed pile construction, the ratio of shaft diameter to bulb 13) diameter is _____.
 - a) 1/1.5 b) $\frac{1}{2}$
 - c) 1/2.5 1/4 d)
- 14) During the process of well sinking, in order to overcome skin friction and loss in weight of the well due to buoyancy, the term that is applied is ____.
 - a) Kentiledge
- b) Bed rock
- c) Cutting edge

d) Steining Set

SLR-FM-82

Set

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF FOUNDATIONS**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q. No. 4 & Q. No. 8 is compulsory. Attempt any two questions from remaining questions from each sections.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data and mention it clearly.

Section – I

Q.2	a)	Discuss the depth of explorations necessary for various types of	03
		foundations.	
	b)	Explain Geophysical Exploration with neat sketches.	06

- Explain Geophysical Exploration with neat sketches. b)
- Q.3 a) Explain various types of shear failure of soil?
 - A strip footing 2 m wide carries a load intensity of 400 kN/m² at a depth of b) 06 1.2 m in sand. The saturated unit weight of sand is 19.5 kN/m³ and unit weight above water table is 16.8 kn/m³. The shear strength parameters are c = 0 and $\Phi = 35^{\circ}$. Determine F.O.S w.r.t shear failure for the water table 4 m below G.L. Use Terzaghi's equation.
- Explain in which situation raft foundation is needed? What are the IS Code Q.4 04 a) provision for it?
 - As per IS code rigid method analysis, analyze and find the maximum 06 b) stresses at the corners of the Raft foundation shown below in fig 1. All columns are in square shape of size 400 x 400 mm.



Fig. 1

Max. Marks: 56

03

		SLR-FM-	82
		Set	S
Q.5	a) b)	Discuss the characteristics of Black Cotton soil. Boussinesq equation for vertical stress distribution.	03 06
		Section – II	
Q.6	a)	Explain types of piles with neat sketch.	03
	b)	A group of 9 piles with 3 piles in row were driven into a soft clay extending from ground level up to a great depth. The dia and the length of piles were 30 cm and 10 m respectively. The unconfined compressive strength of the clay is 70 kpa. If the piles are placed at 90 cm c/c, compute the allowable load on the pile group on the of shear failure criteria. Take factor of safety = 2.5 For $\phi u = 0$, Nc = 9.	06
Q.7	a) b)	Explain Pneumatic caisson with neat sketch. What are the various components of well foundation? Explain the design of individual component of the Well Foundation.	03 06
Q.8	a) b)	Resonance occurs at a frequency of 20 cps in vertical vibration of a test block 1m x 1m x 1m. Calculate the coefficient of elastic uniform compression. Draw the sketch of block foundation with all 6 degrees of freedom? (3 translation and 3 rotation)	06 04
Q.9	Writ a) b) c) d)	e short notes on any three Methods of Underpinning Box caisson Pile cap Vibration absorbers	09

e) Criteria for satisfaction performance of machine foundation
				Civil E	ingineeri	ng			
		A	DVANCED D	ESIGN O	F ČONCR	ETE STRU	ICTURE	ES	
Day a Time	& Date : 02:3	e: Tue 0 PM	esday, 17-12-20 To 05:30 PM	019				Max. Marks	: 70
Instr	uctio	ns: 1)) Q. No. 1 is co	mpulsory an	d should b	e solved in fir	st 30 mir	nutes in ansv	ver
			Book.						
		2) Figures to the	e right indicat	te full mark	S.			
		4) Assume suita	ble data if ne	ecessarv a	nd mention it	clearly b	efore the	
		- ,	Solution.						
		5)) Draw the app	ropriate sket	tches when	ever necessa	ary.		
-			M	CQ/Objecti	ve Type Q	uestions			
Dura	tion: 3	SO Mir	nutes					Marks	:14
Q.1	Choo 1)	ose tł The thick	ne correct alte minimum perce mess more tha	entage of rei n 450 mm is	om the opti inforcemen	ts in case of	water tan	ıks having	14
		a) c)	0.3% 0.12%		b) d)	0.2% 0.15%			
	2)	Mini a) b) c) d)	mum spacing of 2.0 times the 2.5 times the 3.0 times the none of these	of end bearir shaft diamet shaft diamet shaft diamet	ng piles as p ter ter ter	oer IS 2911 is	3		
	3)	The a) b) c) d)	spacing of the two times the three times th 300mm 450mm	reinforceme slab depth e slab depth	nts in flat s	lab is restrict	ed to		
	4)	As p than	er IS the spaci	ng of situ rib	os in case o	f grid floors s	hould no	t be more	
		a) c)	1.5m 1.0m		b) d)	1.75m 1.20m			
	5)	The tank	minimum perce s	entage of rei	inforcemen	ts in case of	base slat	o of water	
		a)	0.3%		b)	0.2%			
		C)	0.12%		d)	0.15%			
	6)	The nota	radial shear in tions.	case of circ	ular water t	ank is given l	су	with usual	
		-)	$\cap \pi$ $\pi \pi/2$		F)		-/0		

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

Seat

No.

- Qr = 1.5 qr/2Qr = qr/2a) b) Qr = 1.5qr/3C) Qr = qr/3d)
- 7)
 - The thickness of simply supported circular slab is taken as _____. a) 1/15 to 1/20th radius of slab b) 1/10 to 1/15th radius of slab c) 1/20 to 1/25th radius of slab d) none of these

SLR-FM-83



- Set Ρ
- For simply supported circular slab, if the total factored super imposed load 8) inclusive of self weight is 11.625KN/m², then the circumferential moment is KNm
 - 19.62 b) 20.62 a)
 - c) 18.62 d) 18.672
- As per IS the permissible shear stress in concrete in case of combined 9) footing is given by _____.
 - $\begin{array}{c} 0.25 \ {(f_{ck})}^{1/2} \\ 0.16 \ {(f_{ck})}^{1/3} \end{array}$ $\begin{array}{l} 0.36{(f_{ck})}^{1/2} \\ 0.16~{(f_{ck})}^{1/2} \end{array}$ a) b)
 - C) d)
- 10) Meridional thrust and circumferential force develops in case of _____ of water tanks.
 - cylindrical wall b)
 - C) base slab d) none of these
- 11) In approximate method of design of circular water tanks one can design the lower portion h as a cantilever
 - H/3 or 1m whichever is more a)
 - H/4 or 1m whichever is more b)

domes

a)

a)

- C) H/4 or 1.5m whichever is more
- H/3 or 1.2m whichever is more d)
- 12) Hoop tension in case of circular water tanks is given by formula _____. wHD/3
 - wHD/2 b)
 - wHD/4 d) none of these C)
- The minimum free board in case of water tanks is approximately taken as 13)
 - 450mm 200mm b) a)
 - 500mm C) 750mm d)
- 14) The maximum deflection coefficient for fixed circular slab at center is
 - 1/64 a) 3/64 b)
 - 5/64 d) 2/64 c)

Set

Seat	
No.	

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Attempt any two questions from each section.

2) Figures to the right indicate full marks.

Section – I

 Q.2 Design interior panel of flat slab floor system for a ware house 24 m X 24m
 14 divided into panel of 6m X 6m. Loading class = 5KN/m² Material M20 gade of concrete and Fe415 grade of steel Column size 400mm diameter Sketch the reinforcement details in an interior panel of flat slab.

- Q.3 Design a combined footing to support two columns of size 300mm X 300mm 14 and 400mm X 400mm carrying 800KN and 1200 KN loads respectively. These columns are located 3.6m apart and column carrying 800 KN is flush with the property line. Assume SBC of 200KN/m². Assume M20 grade of concrete Fe 415 grade of steel.
- Q.4 An RC column of size 500mm X 500mm is supported on four piles of 300mm 14 diameter (bored cast in situ piles). The column carries a load of 1000KN, a moment of 300KNm in x-x direction, and a sheer force of 50 KN on top of the pile. Design pile cap assuming M25 grade of concrete and Fe 415 grade of steel. Further, assume that the piles are capable of resisting the reaction from the pile cap.

Section – II

- Q.5 Design a flat bottom elevated water tank of diameter 9.5m and total height 4m 14 which is supported by ring beam of 7m diameter. The ring beam is to be supported by six columns equally placed. Use M25 grade of concrete and Fe415 grade of steel. Design following components of the water tank
 - a) cylindrical wall
 - b) bottom slab

b)

- Q.6 Design an open water tank of size 4m X 9m X 4m deep resting on firm ground. 14 Use M25 grade of concrete and Fe415 grade of steel. Approximate method may be used for the analysis.
- Q.7 Design a underground water tank for the following data:a) capacity of tank =75000 lit

14

- density of soil =16KN/m³
- c) angle of repose $=30^{\circ}$
- **d)** grade of concrete = M25
- e) grade of steel = Fe415
- f) unit weight of water = 9.8 KN/m^3
- **g)** live load on roof slab =2 KN/m^2

Max. Marks: 56

. .

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

Civil Engineering ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Use of IS Codes are allowed
- 4) Assume suitable data if necessary and mention it clearly before the Solution.
- 5) Draw the appropriate sketches whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- For simply supported circular slab, if the total factored super imposed load inclusive of self weight is 11.625KN/m², then the circumferential moment is _____ KNm
 - a) 19.62 b) 20.62 c) 18.62 d) 18.672
- 2) As per IS the permissible shear stress in concrete in case of combined footing is given by _____.
 - a) $0.25 (f_{ck})^{1/2}$ c) $0.16 (f_{ck})^{1/3}$ b) $0.36 (f_{ck})^{1/2}$ d) $0.16 (f_{ck})^{1/2}$
- 3) Meridional thrust and circumferential force develops in case of _____ of water tanks.
 - a) domesb) cylindrical wallc) base slabd) none of these
- 4) In approximate method of design of circular water tanks one can design the lower portion h as a cantilever _____.
 - a) H/3 or 1m whichever is more
 - b) H/4 or 1m whichever is more
 - c) H/4 or 1.5m whichever is more
 - d) H/3 or 1.2m whichever is more

5) Hoop tension in case of circular water tanks is given by formula _____.

- a) wHD/2 b) wHD/3
- c) wHD/4 d) none of these
- 6) The minimum free board in case of water tanks is approximately taken as
 - a) 200mm b) 450mm
 - c) 750mm d) 500mm
- 7) The maximum deflection coefficient for fixed circular slab at center is
 - a) 3/64 b) 1/64
 - c) 5/64 d) 2/64

Set

Q

Max. Marks: 70

Marks: 14

14

SLR-FM-83

- Set Q
- 8) The minimum percentage of reinforcements in case of water tanks having thickness more than 450 mm is _____.
 a) 0.3% b) 0.2%
 - c) 0.12% d) 0.15%
- 9) Minimum spacing of end bearing piles as per IS 2911 is _____.
 - a) 2.0 times the shaft diameter
 - b) 2.5 times the shaft diameter
 - c) 3.0 times the shaft diameter
 - d) none of these
- 10) The spacing of the reinforcements in flat slab is restricted to _____.
 - a) two times the slab depth
 - b) three times the slab depth
 - c) 300mm
 - d) 450mm

11) As per IS the spacing of situ ribs in case of grid floors should not be more than _____.

- a) 1.5m b) 1.75m c) 1.0m d) 1.20m
- 12) The minimum percentage of reinforcements in case of base slab of water tanks
 - a) 0.3% b) 0.2% c) 0.12% d) 0.15%
- 13) The radial shear in case of circular water tank is given by _____ with usual notations.
 - a) Qr = qr/2 b) Qr = 1.5 qr/2
 - c) Qr = qr/3 d) Qr = 1.5qr/3
- 14) The thickness of simply supported circular slab is taken as ____
 - a) 1/15 to 1/20th radius of slab b)
- b) 1/10 to 1/15th radius of slab
 - c) 1/20 to 1/25th radius of slab
- d) none of these

14

SLR-FM-83

Set

Q

Seat	
No.	

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Attempt any two questions from each section.

2) Figures to the right indicate full marks.

Section – I

 Q.2 Design interior panel of flat slab floor system for a ware house 24 m X 24m
 14 divided into panel of 6m X 6m. Loading class = 5KN/m² Material M20 gade of concrete and Fe415 grade of steel Column size 400mm diameter Sketch the reinforcement details in an interior panel of flat slab.

- Q.3 Design a combined footing to support two columns of size 300mm X 300mm 14 and 400mm X 400mm carrying 800KN and 1200 KN loads respectively. These columns are located 3.6m apart and column carrying 800 KN is flush with the property line. Assume SBC of 200KN/m². Assume M20 grade of concrete Fe 415 grade of steel.
- Q.4 An RC column of size 500mm X 500mm is supported on four piles of 300mm 14 diameter (bored cast in situ piles). The column carries a load of 1000KN, a moment of 300KNm in x-x direction, and a sheer force of 50 KN on top of the pile. Design pile cap assuming M25 grade of concrete and Fe 415 grade of steel. Further, assume that the piles are capable of resisting the reaction from the pile cap.

Section – II

- Q.5 Design a flat bottom elevated water tank of diameter 9.5m and total height 4m 14 which is supported by ring beam of 7m diameter. The ring beam is to be supported by six columns equally placed. Use M25 grade of concrete and Fe415 grade of steel. Design following components of the water tank
 - a) cylindrical wall
 - b) bottom slab
- Q.6 Design an open water tank of size 4m X 9m X 4m deep resting on firm ground. 14 Use M25 grade of concrete and Fe415 grade of steel. Approximate method may be used for the analysis.
- **Q.7** Design a underground water tank for the following data:
 - a) capacity of tank =75000 lit
 - **b)** density of soil = 16KN/m³
 - c) angle of repose $=30^{\circ}$
 - d) grade of concrete = M25
 - e) grade of steel = Fe415
 - f) unit weight of water = 9.8 KN/m^3
 - **g)** live load on roof slab =2 KN/m^2

Max. Marks: 56

		D.[L. (Part - I) (Old) (CGPA) E Civil Engi	xamii neerii	nation Nov/Dec-2019
		Α	DVANCED DESIGN OF C	ONCR	ETE STRUCTURES
Day Time	& Date : 02:3	e: Tu 0 PN	esday, 17-12-2019 I To 05:30 PM		Max. Marks: 70
nsti	uctio	ns: 1) Q. No. 1 is compulsory and sh Book.	ould be	e solved in first 30 minutes in answer
		2) Figures to the right indicate fu	ll marks	S.
		4	 Assume suitable data if neces Solution 	sary ar	nd mention it clearly before the
		5) Draw the appropriate sketches	s when	ever necessary.
Dura	ition: 3	30 Mi	nutes	ype Qi	Marks: 14
).1	Cho	ose t	he correct alternatives from the	he opti	ons. 14
	1)	The tank	minimum percentage of reinfor	cement	ts in case of base slab of water
		a) c)	0.3% 0.12%	b) d)	0.2% 0.15%
	2)	The nota	radial shear in case of circular ations.	water ta	ank is given by with usual
		a) c)	Qr = qr/2 Qr = qr/3	b) d)	Qr = 1.5 qr/2 Qr = 1.5qr/3
	3)	The a) c)	thickness of simply supported of 1/15 to 1/20 th radius of slab 1/20 to 1/25 th radius of slab	circular b) d)	slab is taken as 1/10 to 1/15 th radius of slab none of these
	4)	For inclu	simply supported circular slab, i usive of self weight is 11.625KN KNm	if the to /m ² , the	tal factored super imposed load en the circumferential moment is
		a) c)	19.62 18.62	b) d)	20.62 18.672
	5)	Asp	per IS the permissible shear stre	ess in c	oncrete in case of combined
		1001 a) c)	$\begin{array}{c} \text{(Ing is given by } \underline{\qquad} \\ 0.25 \ \text{(f}_{ck})^{1/2} \\ 0.16 \ \text{(f}_{ck})^{1/3} \end{array}$	b) d)	$0.36(f_{ck})^{1/2}$ 0.16 $(f_{ck})^{1/2}$
	6)	Mer wate	idional thrust and circumferentia er tanks.	al force	develops in case of of
		a) c)	domes base slab	d)	cylindrical wall none of these
	7)	In a the a)	pproximate method of design of lower portion h as a cantilever _ H/3 or 1m whichever is more	[,] circula	ar water tanks one can design

- b) H/4 or 1m whichever is more
- c) H/4 or 1.5m whichever is more
- d) H/3 or 1.2m whichever is more

Seat No.

BF (Part I) (Old) (CGPA) Examination Nov/Dec-2019

D

C

SLR-FM-83

Set R

			SLR-FM-83
			Set R
Hoo a) c)	p tension in case of circular water wHD/2 wHD/4	tanks b) d)	is given by formula wHD/3 none of these
The a) c)	minimum free board in case of wa 200mm 750mm	ater ta b) d)	nks is approximately taken as 450mm 500mm
The a) c)	maximum deflection coefficient fo 3/64 5/64	r fixed b) d)	l circular slab at center is 1/64 2/64
The thick a) c)	minimum percentage of reinforce ness more than 450 mm is 0.3% 0.12%	ments b) d)	in case of water tanks having 0.2% 0.15%
Mini a) b) c) d)	mum spacing of end bearing piles 2.0 times the shaft diameter 2.5 times the shaft diameter 3.0 times the shaft diameter none of these	as pe	er IS 2911 is
The a)	spacing of the reinforcements in f two times the slab depth	lat sla	b is restricted to

- a) three times the slab depth b)
- 300mm C)

8)

9)

10)

11)

12)

13)

450mm d)

14) As per IS the spacing of situ ribs in case of grid floors should not be more than ____ ___b) 1.75m

- 1.5m a)
- c) 1.0m d) 1.20m

Seat	
No.	

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Attempt any two questions from each section.

2) Figures to the right indicate full marks.

Section – I

Q.2 Design interior panel of flat slab floor system for a ware house 24 m X 24m divided into panel of 6m X 6m. Loading class = $5KN/m^2$ Material M20 gade of concrete and Fe415 grade of steel Column size 400mm diameter Sketch the reinforcement details in an interior panel of flat slab.

- Q.3 Design a combined footing to support two columns of size 300mm X 300mm 14 and 400mm X 400mm carrying 800KN and 1200 KN loads respectively. These columns are located 3.6m apart and column carrying 800 KN is flush with the property line. Assume SBC of 200KN/m². Assume M20 grade of concrete Fe 415 grade of steel.
- Q.4 An RC column of size 500mm X 500mm is supported on four piles of 300mm 14 diameter (bored cast in situ piles). The column carries a load of 1000KN, a moment of 300KNm in x-x direction, and a sheer force of 50 KN on top of the pile. Design pile cap assuming M25 grade of concrete and Fe 415 grade of steel. Further, assume that the piles are capable of resisting the reaction from the pile cap.

Section – II

- Q.5 Design a flat bottom elevated water tank of diameter 9.5m and total height 4m 14 which is supported by ring beam of 7m diameter. The ring beam is to be supported by six columns equally placed. Use M25 grade of concrete and Fe415 grade of steel. Design following components of the water tank
 - cylindrical wall a)
 - bottom slab b)
- Q.6 Design an open water tank of size 4m X 9m X 4m deep resting on firm ground. 14 Use M25 grade of concrete and Fe415 grade of steel. Approximate method may be used for the analysis.
- Q.7 Design a underground water tank for the following data: a)

14

- capacity of tank =75000 lit
- density of soil =16KN/m³ b)
- angle of repose $=30^{\circ}$ c)
- grade of concrete = M25d)
- grade of steel = Fe415e)
- unit weight of water = 9.8 KN/m^3 **f**)
- live load on roof slab = 2 KN/m^2 g)

Max. Marks: 56

Set

R

ADVANCED DESIGN OF CONCRETE STRUCTURES Day & Date: Tuesday, 17-12-2019 Max. Marks: 70 Book. 2) Figures to the right indicate full marks. 3) Use of IS Codes are allowed 4) Assume suitable data if necessary and mention it clearly before the Solution. 5) Draw the appropriate sketches whenever necessary. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 14 Q.1 Choose the correct alternatives from the options. 14 Meridional thrust and circumferential force develops in case of _____ of 1) water tanks. a) domes b) cylindrical wall none of these C) base slab d) In approximate method of design of circular water tanks one can design 2) the lower portion h as a cantilever _____. H/3 or 1m whichever is more a) H/4 or 1m whichever is more b) H/4 or 1.5m whichever is more c) H/3 or 1.2m whichever is more d) 3) Hoop tension in case of circular water tanks is given by formula _____. wHD/2 wHD/3 a) b) wHD/4 c) d) none of these 4) The minimum free board in case of water tanks is approximately taken as 200mm 450mm a) b) 750mm 500mm C) d) The maximum deflection coefficient for fixed circular slab at center is 5) 3/64 1/64 a) b) c) 5/64 d) 2/64 The minimum percentage of reinforcements in case of water tanks having 6) thickness more than 450 mm is 0.3% 0.2% b) a) 0.12% d) C) 0.15% Minimum spacing of end bearing piles as per IS 2911 is . 7) 2.0 times the shaft diameter a) b) 2.5 times the shaft diameter 3.0 times the shaft diameter C) none of these d)

Seat No.

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

SLR-FM-83

Set

8)	The a) b) c) d)	spacing of the reinforcements in f two times the slab depth three times the slab depth 300mm 450mm	lat sla	ab is restricted to
9)	As p than	er IS the spacing of situ ribs in ca	se of	grid floors should not be more
	a)	1.5m	b)	1.75m
	C)	1.0m	d)	1.20m
10)	The tanks a)	minimum percentage of reinforce s 0.3%	ments b)	s in case of base slab of water 0.2%
	c)	0.12%	d)	0.15%
11)	The notat	radial shear in case of circular wa tions.	iter ta	nk is given by with usual
	a)	Qr = qr/2	b)	Qr = 1.5 qr/2
	c)	Qr = qr/3	d)	Qr = 1.5qr/3
12)	The	thickness of simply supported circ	ular s	slab is taken as
,	a)	$1/15$ to $1/20^{\text{th}}$ radius of slab	b)	$1/10$ to $1/15^{\text{th}}$ radius of slab
	c)	1/20 to $1/25$ th radius of slab	d)	none of these
13)	For s	simply supported circular slab, if th sive of self weight is 11.625KN/m KNm	he tota ² , the	al factored super imposed load n the circumferential moment is
	<u>_</u>)	10.62	h١	20 62

a)	19.62	D)	20.62
C)	18.62	d)	18.672

- $\begin{array}{lll} \mbox{14}) & \mbox{As per IS the permissible shear stress in concrete in case of combined footing is given by _____.} \\ & \mbox{a}) & \mbox{0.25 } (f_{ck})^{1/2} & \mbox{b}) & \mbox{0.36} (f_{ck})^{1/2} \\ & \mbox{c}) & \mbox{0.16 } (f_{ck})^{1/3} & \mbox{d}) & \mbox{0.16 } (f_{ck})^{1/2} \\ \end{array}$

Set S

Seat	
No.	

Set S

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering

ADVANCED DESIGN OF CONCRETE STRUCTURES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM Max. Marks: 56

Instructions: 1) Attempt any two questions from each section.

2) Figures to the right indicate full marks.

Section – I

 Q.2 Design interior panel of flat slab floor system for a ware house 24 m X 24m
 14 divided into panel of 6m X 6m. Loading class = 5KN/m² Material M20 gade of concrete and Fe415 grade of steel Column size 400mm diameter Sketch the reinforcement details in an interior panel of flat slab.

- Q.3 Design a combined footing to support two columns of size 300mm X 300mm 14 and 400mm X 400mm carrying 800KN and 1200 KN loads respectively. These columns are located 3.6m apart and column carrying 800 KN is flush with the property line. Assume SBC of 200KN/m². Assume M20 grade of concrete Fe 415 grade of steel.
- Q.4 An RC column of size 500mm X 500mm is supported on four piles of 300mm 14 diameter (bored cast in situ piles). The column carries a load of 1000KN, a moment of 300KNm in x-x direction, and a sheer force of 50 KN on top of the pile. Design pile cap assuming M25 grade of concrete and Fe 415 grade of steel. Further, assume that the piles are capable of resisting the reaction from the pile cap.

Section – II

- Q.5 Design a flat bottom elevated water tank of diameter 9.5m and total height 4m 14 which is supported by ring beam of 7m diameter. The ring beam is to be supported by six columns equally placed. Use M25 grade of concrete and Fe415 grade of steel. Design following components of the water tank
 - a) cylindrical wall
 - b) bottom slab
- Q.6 Design an open water tank of size 4m X 9m X 4m deep resting on firm ground. 14 Use M25 grade of concrete and Fe415 grade of steel. Approximate method may be used for the analysis.
- **Q.7** Design a underground water tank for the following data:

- a) capacity of tank =75000 lit
 b) density of soil =16KN/m³
- c) angle of repose $=30^{\circ}$
- d) grade of concrete = M25
- e) grade of steel = Fe415
- f) unit weight of water = 9.8 KN/m^3
- **g)** live load on roof slab =2 KN/m^2

Seat No.

> B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Q.1 Choose the correct alternatives from the options.

- 1) Identify the INCORRECT option.
 - a) "Measure" involves collection of data relating to quality, cost, throughput time etc.
 - b) "Analyze" uses data collected from previous step to understand cause-and-effect relationship and to identify sources of variability
 - c) "Define" imposes creative thinking to about the specific change that can be made in the process.
 - d) "Control" completes all remaining project and to hand off the improved process to the owner along with a process control plan.
- 2) Six sigma implementations can be divided into three generations. Which of the following option is INCORRECT?
 - a) The first generation focused on defect elimination and variability reduction
 - b) Second generation mainly focused on integrating the above with improved business performance through cost reduction.
 - c) Third generation is marked by focus on creating value throughout the organization and for its stakeholders.
 - d) All options are FALSE
- 3) Improving quality through small, incremental improvements is a characteristic of what type of quality management system?
 - a) Just-in-time b) Six Sigma
 - c) Kaizen d) Total Quality Management
- 4) The following is (are) the type(s) of flow process chart: Man type, Material type, Equipment type. The correct answer is: _____.
 - a) All of these

c)

- b) Material and Equipment typed) Only man type
- Man and Material type
- 5) Work study is most useful in ____
 - a) improving industrial relations
 - b) Where production activities are involved
 - c) In judging the rating of machines
 - d) In judging the output of a man and improving it

Set P

Max. Marks: 70

Marks: 14

				SLR-FM-84
				Set P
6)	Woi a) c)	rk study is also recognized as Both Time and motion study Motion study	b) d)	None of these Time study
7)	In p	rocess charts, the symbol used f	or sto	rage is
	a)	Square	b)	Triangle
	c)	Arrow	d)	Circle
8)	In p	rocess charts, the symbol used f	or ins	pection is
	a)	Circle	b)	Arrow
	c)	Square	d)	Triangle
9)	The	correct order of procedure in me	ethod	study is
	a)	Select - Record - Examine - De	evelop	- Define - Install - Maintain
	b)	Select - Record - Examine - De	efine -	Develop - Install - Maintain
	c)	Select - Define - Examine - De	velop	- Record - Install - Maintain
	d)	Select - Record - Develop - Ex	amine	- Define - Install - Maintain
10)	Ana	lysis of Therbligs is most closely	relate	ed to
	a)	all of these	b)	motion study
	c)	methods analysis	d)	work sampling
11)	A a) c)	is based on film analysis. Operation flow chart String diagram	b) d)	Outline process chart SIMO chart
12)	In S	IMO chart, the movements are r	ecord	ed against time measured in
	a)	Winks	b)	Micro seconds
	c)	Seconds	d)	Minutes
13)	Fun	ctional analysis is step of	value	engineering job plan.
	a)	I	b)	II
	c)	III	d)	IV
14)	Aes a)	thetic aspects of the product are Use value	majo b)	rly related to Esteem value

Cost value C)

- Esteem value
- b) d) Exchange value

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- Q.2 a) Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 Discuss types of failures in reliability analysis.
 O4

Max. Marks: 56

Set

- **Q.9** a) Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

Seat								Se	et	Q
		B.E	. (Part - I)) (Old) (CGF	PA) Exan	ni	nation Nov/Dec-2	019	L	
			. ,	Ċivil	Enginee	riı	ng			
	MANAGERIAL TECHNIQUES									
Day & Time:	& Date 02:30	e: Tue 0 PM	esday, 17-12 To 05:30 P	2-2019 M				Max. Ma	rks	: 70
Instru	nstructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.									
		2)	Figures to	the right indica	ate full ma	rk	S.			
Durat	:	0 14:0		MCQ/Object	ive Type	Qı	uestions	Ma		
Durat	ion: 3	U IVIIN	utes					IVIa	rks	: 14
Q.1	Choo 1)	ose th	e correct a	alternatives fr	om the op	oti	ions.			14
	')	a) c)	Circle Square	is, the symbol	b) d)		Arrow Triangle			
	2)	The a) b) c) d)	correct orde Select - Re Select - Re Select - De Select - Re	er of procedure ecord - Examir ecord - Examir efine - Examin ecord - Develo	e in metho ne - Develo ne - Define e - Develo p - Examil	d : p p ne	study is - Define - Install - Ma Develop - Install - Ma - Record - Install - Ma - Define - Install - Ma	iintain iintain iintain iintain		
	3)	Anal <u>y</u> a) c)	ysis of Ther all of these methods a	rbligs is most o e nalysis	closely rela b) d)	ate	ed to motion study work sampling			
	4)	A a) c)	is base Operation String diag	ed on film anal <u>y</u> flow chart gram	ysis. b) d)		Outline process char SIMO chart	t		
	5)	In SI a) c)	MO chart, t Winks Seconds	he movements	s are reco b) d)	rde	ed against time meas Micro seconds Minutes	ured in		·
	6)	Func a) c)	tional analy I III	/sis is s	tep of valu b) d)	Je	engineering job plan. II IV			
	7)	Aest a) c)	hetic aspec Use value Cost value	ts of the produ	ict are ma b) d)	jor	ly related to Esteem value Exchange value			
	8)	Ident a)	tify the INC "Measure" i throughput	ORRECT optic involves collec time etc.	on. tion of dat	a	relating to quality, cos	st,		
		b)	"Analyze" u cause-and-	ses data colle effect relations	cted from ship and to	pr Die	evious step to unders dentify sources of var	tand iability		
		C)	"Define" im can be mac	poses creative	e thinking t	0	about the specific cha	ange that		
		d)	"Control" co	ompletes all re the owner alor	maining p ng with a p	roj oro	ect and to hand off th cess control plan.	e improve	ed	

SLR-FM-84 Set Q

Set

- 9) Six sigma implementations can be divided into three generations. Which of the following option is INCORRECT?
 - The first generation focused on defect elimination and variability a) reduction
 - Second generation mainly focused on integrating the above with b) improved business performance through cost reduction.
 - Third generation is marked by focus on creating value throughout the c) organization and for its stakeholders.
 - All options are FALSE d)
- Improving quality through small, incremental improvements is a 10) characteristic of what type of quality management system?
 - a) Just-in-time b) Six Sigma
 - c) Kaizen d) **Total Quality Management**
- 11) The following is (are) the type(s) of flow process chart: Man type, Material type, Equipment type. The correct answer is: _____
 - a) All of these
 - Material and Equipment type b) Only man type d)
- 12) Work study is most useful in _

C)

Man and Material type

- improving industrial relations a)
- Where production activities are involved b)
- In judging the rating of machines c)
- In judging the output of a man and improving it d)
- Work study is also recognized as 13)
 - Both Time and motion study b) None of these a)
 - c) Motion study d) Time study
- 14) In process charts, the symbol used for storage is
 - Square a) C)
- Triangle b) d)

Arrow

Circle

Seat No.

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- Q.2 a) Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 b) Discuss types of failures in reliability analysis.
 04
 04

Max. Marks: 56

Set

Q

- **Q.9** a) Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

Seat No.						Set	R
	•	B.E. (Part -) (Old) (CGPA)	Exami	nation Nov/Dec-2019		
			Civil Eng	jineeri TFCH	ng NIQUES		
Day & Time:	Date	e: Tuesday, 17-1 0 PM To 05:30 I	2-2019 PM		Max	. Marks	: 70
Instru	ction	1s: 1) Q. No. 1 i Book.	s compulsory and s	should b	e solved in first 30 minutes	in ansv	ver
		2) Figures to	the right indicate f	ull mark	S.		
Durati	on. 3	0 Minutes	MCQ/Objective	Type Q	uestions	Marks	• 1/
Q1	Choc	se the correct	alternatives from	the ont	ions	Marks	. 14 14
	1)	Work study is r a) improving b) Where pro c) In judging d) In judging	nost useful in industrial relations duction activities au the rating of machin the output of a mar	 re involv nes n and im	red proving it		
2	2)	Work study is a a) Both Time c) Motion stu	llso recognized as _ e and motion study udy	b) d)	None of these Time study		
3	3)	In process char a) Square c) Arrow	ts, the symbol used	d for sto b) d)	rage is Triangle Circle		
2	4)	In process char a) Circle c) Square	ts, the symbol used	d for ins b) d)	pection is Arrow Triangle		
Ę	5)	The correct orda)Select - Rb)Select - Rc)Select - Dd)Select - R	er of procedure in r ecord - Examine - l ecord - Examine - l efine - Examine - D ecord - Develop - E	method Develop Define - Develop Examine	study is - Define - Install - Maintair Develop - Install - Maintair - Record - Install - Maintair - Define - Install - Maintair	า ก ก	
6	6)	Analysis of The a) all of thes c) methods	erbligs is most close e analysis	ely relate b) d)	ed to motion study work sampling		
7	7)	A is bas a) Operation c) String dia	ed on film analysis. flow chart gram	b) d)	Outline process chart SIMO chart		
8	8)	In SIMO chart, a) Winks c) Seconds	the movements are	e record b) d)	ed against time measured Micro seconds Minutes	in	_ .
Q	9)	Functional ana a) I c) III	ysis is step	of value b) d)	engineering job plan. II IV		

- SLR-FM-84 Set R
- 10) Aesthetic aspects of the product are majorly related to _____.
 - a) Use value

b) Esteem value

c) Cost value

- d) Exchange value
- 11) Identify the INCORRECT option.
 - a) "Measure" involves collection of data relating to quality, cost, throughput time etc.
 - b) "Analyze" uses data collected from previous step to understand cause-and-effect relationship and to identify sources of variability
 - c) "Define" imposes creative thinking to about the specific change that can be made in the process.
 - d) "Control" completes all remaining project and to hand off the improved process to the owner along with a process control plan.
- 12) Six sigma implementations can be divided into three generations. Which of the following option is INCORRECT?
 - a) The first generation focused on defect elimination and variability reduction
 - b) Second generation mainly focused on integrating the above with improved business performance through cost reduction.
 - c) Third generation is marked by focus on creating value throughout the organization and for its stakeholders.
 - d) All options are FALSE
- 13) Improving quality through small, incremental improvements is a characteristic of what type of quality management system?
 - a) Just-in-timeb) Six Sigmac) Kaizend) Total Qual
 - d) Total Quality Management
- 14) The following is (are) the type(s) of flow process chart: Man type, Material type, Equipment type. The correct answer is: _____.
 - a) All of these

- b) Material and Equipment type
- c) Man and Material type
- d) Only man type

Set

R

Seat	
No.	

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- Q.2 a) Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 b) Discuss types of failures in reliability analysis.
 04

Max. Marks: 56

- **Q.9** a) Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

	B.E	E. (Part - I) (Old) (CGPA) Ex Civil Engir	kami Neeri	nation Nov/Dec-2019	
		MANAGERIAL T	ECH	NIQUES	
& Date : 02:30	e: Tu 0 PM	esday, 17-12-2019 I To 05:30 PM		Max. Ma	arks: 70
uctior	าร: 1) Q. No. 1 is compulsory and sho Book.	ould b	e solved in first 30 minutes in a	nswer
	2) Figures to the right indicate full	mark	S.	
tion: 3	0 Mii	MCQ/Objective Ty	pe Q	uestions	orke: 11
Choc 1)	o nin ose tl Ana	he correct alternatives from th lysis of Therbligs is most closely	e opt	ions. ed to	14
	a) c)	methods analysis	d)	work sampling	
2)	A a) c)	is based on film analysis. Operation flow chart String diagram	b) d)	Outline process chart SIMO chart	
3)	In S a) c)	IMO chart, the movements are re Winks Seconds	ecord b) d)	ed against time measured in Micro seconds Minutes	
4)	Fun a) c)	ctional analysis is step of I III	value b) d)	engineering job plan. II IV	
5)	Aest a) c)	thetic aspects of the product are Use value Cost value	majo b) d)	rly related to Esteem value Exchange value	
6)	lden a)	tify the INCORRECT option. "Measure" involves collection of throughput time etc.	data	relating to quality, cost,	
	b)	"Analyze" uses data collected fr cause-and-effect relationship ar	om pi nd to i	evious step to understand dentify sources of variability	
	c)	"Define" imposes creative thinki	ng to	about the specific change that	
	d)	"Control" completes all remaining process to the owner along with	g pro a pro	ject and to hand off the improve ocess control plan.	əd
7)	Six s the f a)	sigma implementations can be d following option is INCORRECT? The first generation focused on reduction	ivideo defec	l into three generations. Which t elimination and variability	of
	b)	Second generation mainly focus improved business performance	ed or thro	n integrating the above with ugh cost reduction.	
	c)	Third generation is marked by for organization and for its stakehol All options are FALSE	ders.	on creating value throughout th	e
	& Date :: 02:30 uction tion: 3 Choc 1) 2) 3) 4) 5) 6) 7)	B.E & Date: Tur : 02:30 PM uctions: 1 2 tion: 30 Min Choose th 1) Ana a) c) 2) A a) c) 2) A a) c) 3) In S a) c) 3) In S a) c) 3) In S a) c) 4) Fund a) c) 5) Aes a) c) 5) Aes a) c) 6) Iden a) b) c) d) 7) Six s the f a) b) c) d) c) d)	 B.E. (Part - I) (Old) (CGPA) Exciti Engine MANAGERIAL T & Date: Tuesday, 17-12-2019 © 02:30 PM To 05:30 PM uctions: 1) Q. No. 1 is compulsory and show Book. 2) Figures to the right indicate full MCQ/Objective Ty tion: 30 Minutes Choose the correct alternatives from the 1) Analysis of Therbligs is most closely a) all of these c) methods analysis 2) A is based on film analysis. a) Operation flow chart c) String diagram 3) In SIMO chart, the movements are real a) Winks c) Seconds 4) Functional analysis is step of a) I c) III 5) Aesthetic aspects of the product are a) Use value c) Cost value 6) Identify the INCORRECT option. a) "Measure" involves collection of throughput time etc. b) "Analyze" uses data collected from cause-and-effect relationship are c) "Define" imposes creative thinking can be made in the process. d) "Control" completes all remaining process to the owner along with 7) Six sigma implementations can be di the following option is INCORRECT? a) The first generation focused on reduction b) Second generation mainly focus improved business performance c) Third generation is marked by for organization and for its stakehol d) All options are FALSE 	 B.E. (Part - I) (Old) (CGPA) Exami Civil Engineeri MANAGERIAL TECH & Date: Tuesday, 17-12-2019 : 02:30 PM To 05:30 PM uctions: 1) Q. No. 1 is compulsory and should b Book. 2) Figures to the right indicate full mark MCQ/Objective Type Q tion: 30 Minutes Choose the correct alternatives from the opt 1) Analysis of Therbligs is most closely relate a) all of these b) c) methods analysis d) 2) A is based on film analysis. a) Operation flow chart b) c) String diagram d) 3) In SIMO chart, the movements are record a) Winks b) c) Seconds d) 4) Functional analysis is step of value a) I b) c) III d) 5) Aesthetic aspects of the product are majo a) Use value b) c) Cost value d) 6) Identify the INCORRECT option. a) "Measure" involves collection of data throughput time etc. b) "Analyze" uses data collected from pr cause-and-effect relationship and to i c) "Define" imposes creative thinking to can be made in the process. d) "Control" completes all remaining pro process to the owner along with a pro 7) Six sigma implementations can be divided the following option is INCORRECT? a) The first generation focused on defect reduction b) Second generation mainly focused or improved business performance throus or analyzed or improved business performan	 B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES & Date: Tuesday, 17-12-2019 Max. Mathematical Mathmatical Mathematical Mathematical Mathematical Mathematical Math

Seat

No.

SLR-FM-84 Set S

- Set S 8) Improving quality through small, incremental improvements is a characteristic of what type of quality management system? Just-in-time Six Sigma a) b) C) Kaizen d) Total Quality Management The following is (are) the type(s) of flow process chart: Man type, Material 9) type, Equipment type. The correct answer is: _____ All of these Material and Equipment type a) b) Man and Material type d) Only man type C) 10) Work study is most useful in ____ improving industrial relations a) Where production activities are involved b) In judging the rating of machines c) In judging the output of a man and improving it d) 11) Work study is also recognized as Both Time and motion study b) None of these a) c) Motion study d) Time study 12) In process charts, the symbol used for storage is ___. Square b) Triangle a) Arrow Circle c) d) 13) In process charts, the symbol used for inspection is _____. Circle Arrow a) b) C) Square d) Triangle
- 14) The correct order of procedure in method study is _____
 - a) Select Record Examine Develop Define Install Maintain
 - b) Select Record Examine Define Develop Install Maintain
 - c) Select Define Examine Develop Record Install Maintain
 - d) Select Record Develop Examine Define Install Maintain

Seat No.

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Civil Engineering MANAGERIAL TECHNIQUES

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 and Q. No. 6 are compulsory.

- 2) Solve any two questions from each section.
- 3) Figures to the right indicate full marks.

Section – I

- Q.2 a) Explain advantages of Work study?
 - **b)** State and explain the eight steps or procedures in Method study.
- Q.3 a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time but their opinion on rating the worker differed. The experienced engineer rated the worker 100% and the other engineer rated the worker 120%. They used a 10% allowance.

Cycle time (in minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- 1) Determine the standard time using the experienced industrial 02 engineer's worker rating. 2) Find the standard time using the worker rating of inexperienced 02 industrial engineer. b) Explain recording techniques for the motion study. 04 Q.4 a) Explain Total Quality Management. 04 b) Explain 'KAIZEN'. 04 a) Explain 5S Techniques. 04 Q.5 b) Explain Contributions by Dr J. M. Juran 04 Section – II a) State and explain Steps of work sampling procedure. Q.6 06 b) An office worker wants to perform work sampling for task T. It was 06 estimated that employees are idle 20% of the time. An office worker would like to take a work sample with accuracy of 4% desired confidence level of 95.45%. Assuming Z value as 2 for confidence level of 95.45%, calculate the number of samples required. Q.7 a) What are the objectives of value engineering and Value Analysis? 04 **b)** Write a short note on Fault Tree Analysis (FTA). 04
- Q.8 a) Write a short note on Failure mode and effects analysis (FMEA).
 b) Discuss types of failures in reliability analysis.
 04

Max. Marks: 56

Set

- **Q.9** a) Write a note on Techniques in Value Analysis.
 - b) Three contractors A, B, and C are bidding for a project. A has half the 04 chance that B has. B has two thirds as likely as C for the award of contract. What is the probability of each contractor, if only he gets the contract?

		2 3) Write the correct option for each) While solving MCQ IS 456-2000	n ques), IS 3	stion. 3370 and IS 1343 are not allowed.	
			MCQ/Objective Typ	be Qu	lestions	
Dura	tion: 3	30 Mir	nutes		Marks	: 14
Q.1	Cho 1)	ose tl In w a) c)	he correct alternatives from the ater tank, for Fe ₅₀₀ the permissibl 125 N/mm ² 130 N/mm ²	e opti e e tens b) d)	ons and rewrite the sentence. sile stress is 150 N/mm ² 190 N/mm ²	14 01
	2)	The a) c)	horizontal portion of a step in a s Rise Winder	tairs d b) d)	case, is known as Tread Flight	01
	3)	The wall a) c)	minimum width of stem slab at be H/15 H/18	b) d)	is for cantilever retaining H/12 H/20	01
	4)	Afte a) c)	r pre-stressing process is comple Shrinkage of concrete Elastic shortening of concrete	ted, a b) d)	loss of stress is due to Creep of Concrete All of above	01
	5)	The a) c)	loss of stress due to curvature ef Alignment Centerline	fect d b) d)	epends upon Midpoint Exterior point	01
	6)	'P' is stres is (Z mon a) c)	is the pre-stressed force applied to ssed beam whose area of cross s f(x). The minimum stress on the beam nent is f = (P/A) - (Z/M) f = (P/A) - (M/Z)	b tend section am su b) d)	lon of a rectangular pre- n is (A) and sectional modulus Ibjected to a maximum bending f = (A/P) - (M/Z) f = (P/A) - (M/6Z)	01
	7)	The conc a) c)	stability of retaining wall is check dition? Overturning about toe Both of above	ed foi b) d)	r which of the following Overturning about heal None of these	01
	8)	The load a) b) c)	algebraic sum of bending momen s is called as Primary prestressing moment Secondary prestressing momen Resulting moment	nts du t	e to prestress and external	01

Day & Date: Friday, 22-11-2019

Book.

All of above

d)

Time: 02:30 PM To 05:30 PM

Seat

No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

DESIGN OF CONCRETE STRUCTURES – II

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

Max. Marks: 70

SLR-FM-89

Set

Ρ

SLR-FM-89 Set Ρ 9) Find the area and the depth of foundation required for a column carrying 02 on axial load of 1250kN. The safe bearing capacity of the soil is 120kN/m². The soil at the sight weighs 18 kN/m³ and has an angle of repose of 30°. 11.46 m², 0.74 m 12.46 m², 0.75 m b) a) 10 m^2 , 0.6 m 11 m², 0.8 m c) d) 10) A concrete beam of rectangular cross section 200 mm x 400 mm is 02 prestressed with a force of 400 kN at an eccentricity of 100 mm. The maximum compressive stress in the concrete is _ 7.5 Mpa a) b) 12.5 Mpa 5 Mpa 2.5 Mpa C) d) The circular water tank having a capacity of 400000 liters and water depth 11) 02

4 m including free board of 200 mm. Calculate the diameter of tank _____.

b)

d)

11.5m

12 m

a) c) 11.57 m

11.2m

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF CONCRETE STRUCTURES – II**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. II and Q. No. VI are compulsory.

- 2) Solve any two from Q. No. III to Q. No. V and Q. No. VII to Q. No. IX questions from each section.
- 3) Use of IS 456, IS 1343 and IS 3370 part IV and non programmable calculator are allowed.
- 4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

- Q.2 Design the dog-legged type staircase for a residential building using following 80 data floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps = 175 mm riser and 250 mm tread, live load is 3 kN/m² and assume width of stair is 1.0 m. Use M₂₀ concrete and Fe₄₁₅ steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side.
- Q.3 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. 10 SBC of soil is 200 kN/m², angle of repose of the soil is 30⁰ and unit weight of soil 18 kN/m², super imposed load due to traffic is 12 kN/m², width of the slab base is 3.2 m, toe projection is 0.6 m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Design a circular water tank having capacity 500000 liters, resting on firm Q.4 10 ground is free at top and bottom is fixed. Depth of water 3 m, assume free board of 300 mm and solve by IS code method. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.5 Design a rectangular footing for column axially loaded of size 230 mm \times 550 10 mm carrying 1100 kN load. The SBC of soil is 180 kN/m². Use M₂₀ concrete and Fe₄₁₅ steel. Sketch the details of reinforcement.

Section – II

- Q.6 A prestressed concrete beam 250 mm x 750 mm is prestressed by a parabolic 80 cable located at an eccentricity of 125mm at mid span and zero at the supports. If the beam has a span of 10 m and carries a uniformly distributed load of 6 kN/m, find the effective prestressing force necessary in the cable for zero shear stress in the beam. For this condition find the stress at mid span section. Concrete weighs at 25 kN/m².
- Q.7 A post tensioned concrete beam 250 mm x 400 mm has a span of 12m. The 10 beam is prestressed by steel wires of area 350mm² provided at a uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm². Determine the percentage loss of stress in the wires. Take $E_s = 210 \text{ kN/mm}^2$, $E_c = 35 \text{ kN/mm}^2$, Ultimate creep strain = 22×10^{-6} mm/mm per N/mm², Shrinkage of concrete = 215×10^{-6} , Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25mm, Friction coefficient for wave effect K = 0.00015m.

Max. Marks: 56

Set

SLR-FM-89

Seat No.

SLR-FM-89 Set P

- Q.8 Design PSC I section beam for the following span=18m, superimposed load of 38 kN/m, cube strength of concrete at 28 days is 35kN/m², safe stress in concrete at transfer= 0.5 fck, allowable tensile stress in concrete is 0.129√(fck), safe stress in steel is 60 % of ultimate stress, total loss of stress 18%, ultimate stress in steel 1400 MPa.
- Q.9 A prestressed concrete beam 400 mm wide and 800 mm deep. Determine the horizontal, vertical and shear stresses at the point Q(600,600), with bottom of the end block is origin. Find also the principal stresses at Q. the tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm wide and 200 mm deep. The prestressing force is 1050 kN.

Kz	Kq
-2.47	0.251

					SLR-	FM-	89
Seat No.					:	Set	Q
	I	B.E. (Part	- II) (CGPA) Exar Civil Engir N OF CONCRET	ninat leerir E STF	tion Nov/Dec-2019 ng RUCTURES – II		
Day & Time: (Date: F 02:30 F	riday, 22-11- M To 05:30 F	2019 PM	_ • · ·	Max. I	Marks	: 70
Instruc	ctions:	1) Q. No. 1 is Book.	s compulsory and sho	ould be	e solved in first 30 minutes ir	n ansv	ver
		3) While solv	ring MCQ IS 456-200	n ques 0, IS 3	3370 and IS 1343 are not all	owed.	
Durotic		linutoo	MCQ/Objective Ty	pe Qu	uestions	Morko	. 11
	Choose	the correct	alternatives from th	e onti	ا ons and rewrite the senter	viarks Ice	14 1 4
1) Th a) c)	e loss of stre Alignment Centerline	ss due to curvature e	ffect d b) d)	lepends upon Midpoint Exterior point	100.	01
2	?) 'P sti is m	' is the pre-str ressed beam (Z). The minin oment is	ressed force applied t whose area of cross mum stress on the be 	o tend sectior am su	don of a rectangular pre- n is (A) and sectional modul ubjected to a maximum benc	us ling	01
	a) c)	f = (P/A) - f = (P/A) -	(Z/M) (M/Z)	b) d)	f = (A/P) - (M/Z) f = (P/A) - (M/6Z)		
3	3) Th co	ne stability of ndition?	retaining wall is checl	ked for	r which of the following		01
	a) c)	Overturnin Both of ab	g about toe ove	b) d)	Overturning about heal None of these		
4	 F) The loss of a loss o	ne algebraic s ads is called a Primary p Secondary Resulting All of aboy	um of bending mome as restressing moment y prestressing momen moment /e	ents du nt	ue to prestress and external		01
5	5) In a) c)	water tank, fo 125 N/mm 130 N/mm	or Fe_{500} the permissib P_{12}^{2}	le tens b) d)	sile stress is 150 N/mm² 190 N/mm²		01
6	6) Th a) c)	ne horizontal j Rise Winder	portion of a step in a s	stairs d b) d)	case, is known as Tread Flight		01
7	r) Th wa a) c)	ne minimum w all. H/15 H/18	<i>i</i> idth of stem slab at b	bottom b) d)	is for cantilever retai H/12 H/20	ning	01
8	3) Af a) c)	ter pre-stress Shrinkage Elastic sh	ing process is comple of concrete ortening of concrete	eted, a b) d)	a loss of stress is due to Creep of Concrete All of above	<u> </u> .	01

Set Q

9)	A concrete beam of rectangular cross section 200 mm x 400 mm is prestressed with a force of 400 kN at an eccentricity of 100 mm. The maximum compressive stress in the concrete is	02
	a) 7.5 Mpa b) 12.5 Mpa c) 5 Mpa d) 2.5 Mpa	
10)	The circular water tank having a capacity of 400000 liters and water de4 m including free board of 200 mm. Calculate the diameter of tanka)11.5mb)11.57 mc)12 md)11.2m	pth 02
11)	Find the area and the depth of foundation required for a column carryin on axial load of 1250kN. The safe bearing capacity of the soil is 120kN/ The soil at the sight weighs 18 kN/m ³ and has an angle of repose of 30 a) 11 46 m ² 0.74 m b) 12 46 m ² 0.75 m	g 02 ′m². °.

- 11.46 m², 0.74 10 m², 0. 6 m m o m a) c)

11 m², 0.8 m d)

Seat	
No.	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. II and Q. No. VI are compulsory.

- 2) Solve any two from Q. No. III to Q. No. V and Q. No. VII to Q. No. IX questions from each section.
- 3) Use of IS 456, IS 1343 and IS 3370 part IV and non programmable calculator are allowed.
- 4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Design the dog-legged type staircase for a residential building using following data floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair is 1.0 m. Use M₂₀ concrete and Fe₄₁₅ steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side.
- Q.3 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m², angle of repose of the soil is 30⁰ and unit weight of soil 18 kN/m², super imposed load due to traffic is 12 kN/m², width of the slab base is 3.2 m, toe projection is 0.6 m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.4 Design a circular water tank having capacity 500000 liters, resting on firm ground is free at top and bottom is fixed. Depth of water 3 m, assume free board of 300 mm and solve by IS code method. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.5 Design a rectangular footing for column axially loaded of size 230 mm × 550 mm carrying 1100 kN load. The SBC of soil is 180 kN/m². Use M₂₀ concrete and Fe₄₁₅ steel. Sketch the details of reinforcement.

Section – II

- Q.6 A prestressed concrete beam 250 mm x 750 mm is prestressed by a parabolic cable located at an eccentricity of 125mm at mid span and zero at the supports. If the beam has a span of 10 m and carries a uniformly distributed load of 6 kN/m, find the effective prestressing force necessary in the cable for zero shear stress in the beam. For this condition find the stress at mid span section. Concrete weighs at 25 kN/m².
- **Q.7** A post tensioned concrete beam 250 mm x 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at a uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm². Determine the percentage loss of stress in the wires. Take E_{s} = 210 kN/mm², E_{c} = 35 kN/mm², Ultimate creep strain = 22 x 10⁻⁶ mm/mm per N/mm², Shrinkage of concrete = 215 x 10⁻⁶, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25mm, Friction coefficient for wave effect K = 0.00015m.

Max. Marks: 56

Set Q

SLR-FM-89 Set Q

- Q.8 Design PSC I section beam for the following span=18m, superimposed load of 38 kN/m, cube strength of concrete at 28 days is 35kN/m², safe stress in concrete at transfer= 0.5 fck, allowable tensile stress in concrete is 0.129√(fck), safe stress in steel is 60 % of ultimate stress, total loss of stress 18%, ultimate stress in steel 1400 MPa.
- Q.9 A prestressed concrete beam 400 mm wide and 800 mm deep. Determine the horizontal, vertical and shear stresses at the point Q(600,600), with bottom of the end block is origin. Find also the principal stresses at Q. the tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm wide and 200 mm deep. The prestressing force is 1050 kN.

Kz	Kq
-2.47	0.251
Seat	
------	--
No.	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

DESIGN OF CONCRETE STRUCTURES – II

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Write the correct option for each question.
- 3) While solving MCQ IS 456-2000, IS 3370 and IS 1343 are not allowed.

			MCQ/Objective Typ	e Qu	estions	
Dura	tion: 3	0 Min	nutes		Marks:	: 14
Q.1	Choc 1)	se th The wall.	ne correct alternatives from the minimum width of stem slab at be	optic ottom	ons and rewrite the sentence. is for cantilever retaining	14 01
		a) c)	H/15 H/18	b) d)	H/12 H/20	
	2)	After a) c)	pre-stressing process is comple Shrinkage of concrete Elastic shortening of concrete	ted, a b) d)	loss of stress is due to Creep of Concrete All of above	01
	3)	The a) c)	loss of stress due to curvature ef Alignment Centerline	fect de b) d)	epends upon Midpoint Exterior point	01
	4)	'P' is stres is (Z) mom a)	the pre-stressed force applied to sed beam whose area of cross s). The minimum stress on the beat nent is f = (P/A) - (Z/M)	tendo ection am sul b)	on of a rectangular pre- i is (A) and sectional modulus bjected to a maximum bending f = (A/P) - (M/Z)	01
		c)	f = (P/A) - (M/Z)	d)	f = (P/A) - (M/6Z)	
	5)	The cond	stability of retaining wall is check lition?	ed for	which of the following	01
		a) c)	Overturning about toe Both of above	b) d)	Overturning about heal None of these	
	6)	The loads a) b) c) d)	algebraic sum of bending momer s is called as Primary prestressing moment Secondary prestressing momen Resulting moment All of above	nts due t	e to prestress and external	01
	7)	In wa a) c)	ater tank, for Fe ₅₀₀ the permissibl 125 N/mm ² 130 N/mm ²	e tens b) d)	ile stress is 150 N/mm ² 190 N/mm ²	01
	8)	The a) c)	horizontal portion of a step in a s Rise Winder	tairs c b) d)	ase, is known as Tread Flight	01

Set

Max. Marks: 70

				SLR-FM-	89
				Set	R
9)	The 4 m a) c)	circular water tank having a capa including free board of 200 mm. 11.5m 12 m	acity o Calcu b) d)	f 400000 liters and water depth late the diameter of tank 11.57 m 11.2m	02
10)	Finc on a The a) c)	I the area and the depth of foundation in the safe be soil at the sight weighs 18 kN/m ³ 11.46 m ² , 0.74 m 10 m ² , 0. 6 m	ation r aring ³ and f b) d)	required for a column carrying capacity of the soil is 120kN/m ² . has an angle of repose of 30°. 12.46 m ² , 0.75 m 11 m ² , 0.8 m	02
11)	A co pres max a) c)	oncrete beam of rectangular cross stressed with a force of 400 kN at timum compressive stress in the 7.5 Mpa 5 Mpa	s secti an ec concre b) d)	ion 200 mm x 400 mm is eccentricity of 100 mm. The ete is 12.5 Mpa 2.5 Mpa	02

Max. Marks: 56

Set R

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) Q. No. II and Q. No. VI are compulsory.

- 2) Solve any two from Q. No. III to Q. No. V and Q. No. VII to Q. No. IX questions from each section.
- 3) Use of IS 456, IS 1343 and IS 3370 part IV and non programmable calculator are allowed.
- 4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Design the dog-legged type staircase for a residential building using following data floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair is 1.0 m. Use M₂₀ concrete and Fe₄₁₅ steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side.
- Q.3 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m², angle of repose of the soil is 30⁰ and unit weight of soil 18 kN/m², super imposed load due to traffic is 12 kN/m², width of the slab base is 3.2 m, toe projection is 0.6 m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.4 Design a circular water tank having capacity 500000 liters, resting on firm ground is free at top and bottom is fixed. Depth of water 3 m, assume free board of 300 mm and solve by IS code method. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.5 Design a rectangular footing for column axially loaded of size 230 mm × 550 mm carrying 1100 kN load. The SBC of soil is 180 kN/m². Use M₂₀ concrete and Fe₄₁₅ steel. Sketch the details of reinforcement.

Section – II

- Q.6 A prestressed concrete beam 250 mm x 750 mm is prestressed by a parabolic cable located at an eccentricity of 125mm at mid span and zero at the supports. If the beam has a span of 10 m and carries a uniformly distributed load of 6 kN/m, find the effective prestressing force necessary in the cable for zero shear stress in the beam. For this condition find the stress at mid span section. Concrete weighs at 25 kN/m².
- **Q.7** A post tensioned concrete beam 250 mm x 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at a uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm². Determine the percentage loss of stress in the wires. Take E_{s} = 210 kN/mm², E_{c} = 35 kN/mm², Ultimate creep strain = 22 x 10⁻⁶ mm/mm per N/mm², Shrinkage of concrete = 215 x 10⁻⁶, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25mm, Friction coefficient for wave effect K = 0.00015m.

SLR-FM-89 Set R

- Q.8 Design PSC I section beam for the following span=18m, superimposed load of 38 kN/m, cube strength of concrete at 28 days is 35kN/m², safe stress in concrete at transfer= 0.5 fck, allowable tensile stress in concrete is 0.129√(fck), safe stress in steel is 60 % of ultimate stress, total loss of stress 18%, ultimate stress in steel 1400 MPa.
- Q.9 A prestressed concrete beam 400 mm wide and 800 mm deep. Determine the horizontal, vertical and shear stresses at the point Q(600,600), with bottom of the end block is origin. Find also the principal stresses at Q. the tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm wide and 200 mm deep. The prestressing force is 1050 kN.

Kz	Kq
-2.47	0.251

Seat	
No.	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

DESIGN OF CONCRETE STRUCTURES – II

Day & Date: Friday, 22-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book. 2) Write the correct option for each question. 3) While solving MCQ IS 456-2000, IS 3370 and IS 1343 are not allowed. **MCQ/Objective Type Questions Duration: 30 Minutes** Marks: 14 Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 The stability of retaining wall is checked for which of the following 01 1) condition? a) Overturning about toe b) Overturning about heal None of these Both of above c) d) The algebraic sum of bending moments due to prestress and external 2) 01 loads is called as . Primary prestressing moment a) Secondary prestressing moment b) c) **Resulting moment** All of above d) In water tank, for Fe₅₀₀ the permissible tensile stress is 01 3) 150 N/mm² 125 N/mm² b) a) 130 N/mm² 190 N/mm² C) d) 4) The horizontal portion of a step in a stairs case, is known as _____. 01 Rise Tread b) a) Winder C) d) Flight The minimum width of stem slab at bottom is _____ for cantilever retaining 5) 01 wall. a) H/15 b) H/12 H/18 H/20 c) d) After pre-stressing process is completed, a loss of stress is due to _____. 6) 01 Shrinkage of concrete Creep of Concrete a) b) Elastic shortening of concrete All of above C) d) The loss of stress due to curvature effect depends upon _____. 7) 01 a) Alignment b) Midpoint Centerline Exterior point C) d) 'P' is the pre-stressed force applied to tendon of a rectangular pre-8) 01 stressed beam whose area of cross section is (A) and sectional modulus is (Z). The minimum stress on the beam subjected to a maximum bending moment is

-			
a)	f = (P/A) - (Z/M)	b)	f = (A/P) - (M/Z)
c)	f = (P/A) - (M/Z)	d)	f = (P/A) - (M/6Z)

Max. Marks: 70

Set

Set S

02

- 9) Find the area and the depth of foundation required for a column carrying 02 on axial load of 1250kN. The safe bearing capacity of the soil is 120kN/m². The soil at the sight weighs 18 kN/m³ and has an angle of repose of 30°. 12.46 m², 0.75 m b)
 - 11.46 m², 0.74 m a) 10 m^2 , 0. 6 m c)
 - 11 m², 0.8 m d)
- 10) A concrete beam of rectangular cross section 200 mm x 400 mm is prestressed with a force of 400 kN at an eccentricity of 100 mm. The maximum compressive stress in the concrete is _ .
 - 7.5 Mpa a) b) 12.5 Mpa
 - 5 Mpa C)

- 2.5 Mpa d)
- The circular water tank having a capacity of 400000 liters and water depth 11) 02 4 m including free board of 200 mm. Calculate the diameter of tank _____.
 - 11.5m a)
 - c) 12 m

11.57 m b) d) 11.2m

Page 14 of 16

Se

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering DESIGN OF CONCRETE STRUCTURES – II

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

Instructions: 1) Q. No. II and Q. No. VI are compulsory.

- 2) Solve any two from Q. No. III to Q. No. V and Q. No. VII to Q. No. IX questions from each section.
- 3) Use of IS 456, IS 1343 and IS 3370 part IV and non programmable calculator are allowed.
- 4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

- **Q.2** Design the dog-legged type staircase for a residential building using following data floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair is 1.0 m. Use M₂₀ concrete and Fe₄₁₅ steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side.
- Q.3 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m², angle of repose of the soil is 30⁰ and unit weight of soil 18 kN/m², super imposed load due to traffic is 12 kN/m², width of the slab base is 3.2 m, toe projection is 0.6 m. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.4 Design a circular water tank having capacity 500000 liters, resting on firm ground is free at top and bottom is fixed. Depth of water 3 m, assume free board of 300 mm and solve by IS code method. Use M₂₅ concrete and Fe₅₀₀ steel.
- Q.5 Design a rectangular footing for column axially loaded of size 230 mm × 550 mm carrying 1100 kN load. The SBC of soil is 180 kN/m². Use M₂₀ concrete and Fe₄₁₅ steel. Sketch the details of reinforcement.

Section – II

- Q.6 A prestressed concrete beam 250 mm x 750 mm is prestressed by a parabolic cable located at an eccentricity of 125mm at mid span and zero at the supports. If the beam has a span of 10 m and carries a uniformly distributed load of 6 kN/m, find the effective prestressing force necessary in the cable for zero shear stress in the beam. For this condition find the stress at mid span section. Concrete weighs at 25 kN/m².
- **Q.7** A post tensioned concrete beam 250 mm x 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at a uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm². Determine the percentage loss of stress in the wires. Take E_{s} = 210 kN/mm², E_{c} = 35 kN/mm², Ultimate creep strain = 22 x 10⁻⁶ mm/mm per N/mm², Shrinkage of concrete = 215 x 10⁻⁶, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25mm, Friction coefficient for wave effect K = 0.00015m.

Max. Marks: 56

Set S

SLR-FM-89 Set S

- Q.8 Design PSC I section beam for the following span=18m, superimposed load of 38 kN/m, cube strength of concrete at 28 days is 35kN/m², safe stress in concrete at transfer= 0.5 fck, allowable tensile stress in concrete is 0.129√(fck), safe stress in steel is 60 % of ultimate stress, total loss of stress 18%, ultimate stress in steel 1400 MPa.
- Q.9 A prestressed concrete beam 400 mm wide and 800 mm deep. Determine the horizontal, vertical and shear stresses at the point Q(600,600), with bottom of the end block is origin. Find also the principal stresses at Q. the tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm wide and 200 mm deep. The prestressing force is 1050 kN.

Kz	Kq
-2.47	0.251

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

CONSTRUCTION PRACTICES AND TOWN PLANNING

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- aims to influence certain key vocational decisions while recognizing 1) that there are many other things that can't and perhaps should not be decided at the outset.
 - Structural Plan a)
 - b) **Comprehensive Plan**
 - **Developmental Plan** c)
 - d) None of these

Ekistics

2) means building houses along the routes of communications radiating from a human settlement.

- Satellite town a)
- b) **Ribbon development** Neighburhood d)
- A piece of land divided into more than 8 parcels, each of which is to be 3) sold separately is called _____.
 - a) Lavout

C)

- b) Subdivision of land
- c) Both 'a' and 'b' d) Neither 'a' nor 'b'
- 4) _ zoning is intended to provide a reward-based system to encourage development that meets established urban development goals.
 - Euclidean a)
 - Performance b)
 - Incentive c)
 - d) **Design-based**
- Zoning regulates not the type of land use, but the form that land 5) use may take.
 - Euclidean a)
 - b) Performance
 - c) Incentive
 - d) Form-based
- 6) With the classification of town planning, which types are not square or rectangular shaped?
 - Dandaka a) b) Sarvatobhadra c)
 - Karmuka Nandyavarka d)



- Max. Marks: 70

Marks: 14

14

7) The town should be divided into different _____ so that suitable rules and regulations can be framed for each of them.

- a) Planning division
- b) Planning Units
- c) Sectors
- d) Land use zones
- 8) Ekistics is the science dealing with ____
 - a) Synthesizing factor affecting human settlement
 - b) Using natural elements in planning
 - c) Socioeconomic study
 - d) Diagnostic survey
- 9) A prefab construction material consisting of hollow EPS foam blocks that are stacked and glued together on-site, creating the form that is filled with reinforcing bars and concrete.
 - a) Structural insulated panels (SIPs)
 - b) Insulating concrete forms (ICFS)
 - c) Steel framing
 - d) Concrete framing
- 10) Developmental Plan involves _____
 - a) plan that singles out for attention of certain aspect of the environment, usually the land uses, the main movement systems and the location of critical facilities and buildings
 - b) plan seeks to combine in one document the prescriptions for all aspects of city development
 - c) a plan for the development or redevelopment or improvement of the area within the jurisdiction of a planning authority.
 - d) all the above
- 11) General land use planning deals with _____.
 - a) Residential
 - b) Institutional
 - c) Forests
 - d) Commercial
- 12) Which of the following is not an excavating equipment?
 - a) Power Shovel
 - b) Back Hoe
 - c) Scrapper
 - d) Dragline
- 13) _____ is used to level the ground and spreads the loose material.
 - a) Excavator b) Grader
 - c) Scraper d) None of these
- 14) _____ type of excavator is used for digging below, at or above operating level in a vertical range.
 - a) Skimmer

- b) Clamshell
- c) Dragline d) Back trench

SLR-FM-90

Set

		SLR-F	M-	90
Seat No.		S	et	Ρ
		B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering CONSTRUCTION PRACTICES AND TOWN PLANNING		
Day & Time:	Date 02:30	e: Saturday, 23-11-2019 Max. M D PM To 05:30 PM	arks	: 56
Instru	iction	 1) Question no.2 and Question no.6 is compulsory. 2) Attempt any two out of Q.3 to Q.5. Attempt any two out of Q.7 to Q 2) Figures to right indicate full marks. 	Q.9.	
		Section – I		
Q.2	Expl a) b)	ain with suitable sketches. Necessity of Town Planning Planning of Chandigarh town		12
Q.3	Write a) b)	e detailed note on. necessity of Land acquisition Neighburhood unit planning		08
Q.4	Expl a) b)	ain Types of Surveys for town planning. Planning for the Village.		08
Q.5	Write a) b)	e detailed note on. Growth pattern of towns Town aesthetics		08
		Section – II		
Q.6	Expl a) b)	ain with suitable sketches. Power Shovel Clamshell		12
Q.7	Write a) b)	e detailed note on. Mechanized construction Cycle time calculation for scraper		08
Q.8	Expl a) b)	ain Types of hoisting equipments Precast construction		08
Q.9	Write a) b)	e detailed note on. Floating and dredging equipment Safety measures in construction		08

Seat	
No.	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

CONSTRUCTION PRACTICES AND TOWN PLANNING

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 1)
 - Ekistics is the science dealing with _
 - Synthesizing factor affecting human settlement a)
 - Using natural elements in planning b)
 - c) Socioeconomic study
 - **Diagnostic survey** d)
 - 2) A prefab construction material consisting of hollow EPS foam blocks that are stacked and glued together on-site, creating the form that is filled with reinforcing bars and concrete.
 - a) Structural insulated panels (SIPs)
 - Insulating concrete forms (ICFS) b)
 - Steel framing C)
 - Concrete framing d)
 - Developmental Plan involves 3)
 - plan that singles out for attention of certain aspect of the a) environment, usually the land uses, the main movement systems and the location of critical facilities and buildings
 - b) plan seeks to combine in one document the prescriptions for all aspects of city development
 - a plan for the development or redevelopment or improvement of the C) area within the jurisdiction of a planning authority.
 - all the above d)
 - 4) General land use planning deals with .
 - Residential a)
 - b) Institutional
 - c) Forests
 - Commercial d)
 - 5) Which of the following is not an excavating equipment?
 - Power Shovel a)
 - Back Hoe b)
 - C) Scrapper
 - Dragline d)
 - 6) is used to level the ground and spreads the loose material.
 - Excavator a)
 - Scraper c)

- b) Grader
- None of these d)

Max. Marks: 70

Marks: 14

Set

- 7) type of excavator is used for digging below, at or above operating level in a vertical range.
 - Skimmer a) C)

- Clamshell b)
- Dragline
- d) Back trench

Set

- aims to influence certain key vocational decisions while recognizing 8) that there are many other things that can't and perhaps should not be decided at the outset.
 - Structural Plan a)
 - b) **Comprehensive Plan**
 - **Developmental Plan** C)
 - None of these d)
- means building houses along the routes of communications 9) radiating from a human settlement.
 - Satellite town a)
- b) Ribbon development Neighburhood
- c) Ekistics d)
- A piece of land divided into more than 8 parcels, each of which is to be

sold separately is called _____. Lavout

- b) Subdivision of land
- Both 'a' and 'b' d) Neither 'a' nor 'b' C)
- 11) zoning is intended to provide a reward-based system to encourage development that meets established urban development goals.
 - Euclidean a)

10)

a)

- Performance b)
- c) Incentive
- d) Design-based
- 12) Zoning regulates not the type of land use, but the form that land use may take.
 - Euclidean a)
 - Performance b)
 - C) Incentive
 - d) Form-based
- With the classification of town planning, which types are not square or 13) rectangular shaped?
 - Dandaka Sarvatobhadra a) b)
 - Karmuka d) c) Nandyavarka
- 14) The town should be divided into different _____ so that suitable rules and regulations can be framed for each of them.
 - Planning division a)
 - b) **Planning Units**
 - Sectors C)
 - Land use zones d)

		SLR-	·FM-	90
Seat No.			Set	Q
		B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering CONSTRUCTION PRACTICES AND TOWN PLANNING		
Day & Time:	Date: 02:30	: Saturday, 23-11-2019 Max.) PM To 05:30 PM	Marks	: 56
Instru	iction	 s: 1) Question no.2 and Question no.6 is compulsory. 2) Attempt any two out of Q.3 to Q.5. Attempt any two out of Q.7 to 2) Figures to right indicate full marks.) Q.9.	
		Section – I		
Q.2	Expla a) b)	ain with suitable sketches. Necessity of Town Planning Planning of Chandigarh town		12
Q.3	Write a) b)	e detailed note on. necessity of Land acquisition Neighburhood unit planning		08
Q.4	Expla a) b)	ain Types of Surveys for town planning. Planning for the Village.		08
Q.5	Write a) b)	e detailed note on. Growth pattern of towns Town aesthetics		08
		Section – II		
Q.6	Expla a) b)	ain with suitable sketches. Power Shovel Clamshell		12
Q.7	Write a) b)	e detailed note on. Mechanized construction Cycle time calculation for scraper		08
Q.8	Expla a) b)	ain Types of hoisting equipments Precast construction		08
Q.9	Write a) b)	e detailed note on. Floating and dredging equipment Safety measures in construction		08

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

CONSTRUCTION PRACTICES AND TOWN PLANNING

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

- Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
 - 2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

1)

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- Zoning regulates not the type of land use, but the form that land use may take.
 - Euclidean a)
 - b) Performance
 - Incentive c)
 - d) Form-based
- 2) With the classification of town planning, which types are not square or rectangular shaped?
 - a) Dandaka b) Sarvatobhadra c)
 - Karmuka Nandyavarka d)
- The town should be divided into different _____ so that suitable rules and 3) regulations can be framed for each of them.
 - Planning division a)
 - **Planning Units** b)
 - Sectors C)
 - d) Land use zones
- 4) Ekistics is the science dealing with _____
 - a) Synthesizing factor affecting human settlement
 - Using natural elements in planning b)
 - Socioeconomic study c)
 - **Diagnostic survey** d)
- A prefab construction material consisting of hollow EPS foam blocks that 5) are stacked and glued together on-site, creating the form that is filled with reinforcing bars and concrete.
 - Structural insulated panels (SIPs) a)
 - b) Insulating concrete forms (ICFS)
 - Steel framing C)
 - Concrete framing d)

Max. Marks: 70

Set

Marks: 14

Page 8 of 12

- 6) Developmental Plan involves .
 - plan that singles out for attention of certain aspect of the a) environment, usually the land uses, the main movement systems and the location of critical facilities and buildings

SLR-FM-90

Set

- plan seeks to combine in one document the prescriptions for all b) aspects of city development
- a plan for the development or redevelopment or improvement of the C) area within the jurisdiction of a planning authority.
- d) all the above
- 7) General land use planning deals with .
 - Residential a)
 - b) Institutional
 - Forests c)
 - Commercial d)
- 8) Which of the following is not an excavating equipment?
 - Power Shovel a)
 - Back Hoe b)
 - C) Scrapper
 - d) Dragline
- 9) is used to level the ground and spreads the loose material.
 - Excavator b) Grader a)
 - None of these C) Scraper d)
- type of excavator is used for digging below, at or above operating 10) level in a vertical range.
 - a) Skimmer

- b) Clamshell
- C) Dragline d) Back trench
- aims to influence certain key vocational decisions while recognizing 11) that there are many other things that can't and perhaps should not be decided at the outset.
 - a) Structural Plan
 - **Comprehensive Plan** b)
 - **Developmental Plan** C)

Both 'a' and 'b'

- d) None of these
- 12) means building houses along the routes of communications radiating from a human settlement.
 - Satellite town Ribbon development a) b) Neighburhood
 - Ekistics d) c)
- A piece of land divided into more than 8 parcels, each of which is to be 13) sold separately is called _____.
 - Lavout b) a)
 - Subdivision of land Neither 'a' nor 'b' d)
- zoning is intended to provide a reward-based system to encourage 14) development that meets established urban development goals.
 - Euclidean a)

c)

- b) Performance
- Incentive c)
- d) Design-based

		SLR-	FM-	90
Seat No.			Set	R
		B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering CONSTRUCTION PRACTICES AND TOWN PLANNING		
Day & Time:	Date: 02:30	Saturday, 23-11-2019 Max. PM To 05:30 PM	Marks	: 56
Instru	ctions	 s: 1) Question no.2 and Question no.6 is compulsory. 2) Attempt any two out of Q.3 to Q.5. Attempt any two out of Q.7 to 2) Figures to right indicate full marks. 	Q.9.	
		Section – I		
Q.2	Expla a) N b) F	iin with suitable sketches. Necessity of Town Planning Planning of Chandigarh town		12
Q.3	Write a) r b) N	detailed note on. necessity of Land acquisition Neighburhood unit planning		08
Q.4	Expla a) 7 b) F	in Types of Surveys for town planning. Planning for the Village.		08
Q.5	Write a) (b) 7	detailed note on. Growth pattern of towns Town aesthetics		08
		Section – II		
Q.6	Expla a) F b) (in with suitable sketches. Power Shovel Clamshell		12
Q.7	Write a) M b) C	detailed note on. Mechanized construction Cycle time calculation for scraper		08
Q.8	Expla a) 7 b) F	in Types of hoisting equipments Precast construction		08
Q.9	Write a) F b) S	detailed note on. Floating and dredging equipment Safety measures in construction		08

Seat	
No.	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

CONSTRUCTION PRACTICES AND TOWN PLANNING

Day & Date: Saturday, 23-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

2) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 1) Developmental Plan involves _____.
 - a) plan that singles out for attention of certain aspect of the environment, usually the land uses, the main movement systems and the location of critical facilities and buildings
 - b) plan seeks to combine in one document the prescriptions for all aspects of city development
 - c) a plan for the development or redevelopment or improvement of the area within the jurisdiction of a planning authority.
 - d) all the above
 - 2) General land use planning deals with _____.
 - a) Residential
 - b) Institutional
 - c) Forests
 - d) Commercial
 - 3) Which of the following is not an excavating equipment?
 - a) Power Shovel
 - b) Back Hoe
 - c) Scrapper
 - d) Dragline

a)

- 4) _____ is used to level the ground and spreads the loose material.
 - Excavator b) Grader
 - c) Scraper d) None of these
- 5) _____ type of excavator is used for digging below, at or above operating level in a vertical range.
 - a) Skimmer c) Dragline
 - b) Clamshell d) Back trench
- 6) _____ aims to influence certain key vocational decisions while recognizing that there are many other things that can't and perhaps should not be decided at the outset.
 - a) Structural Plan
 - b) Comprehensive Plan
 - c) Developmental Plan
 - d) None of these

Max. Marks: 70

Marks: 14

Set

- C) Incentive d) Design-based use may take. Euclidean a) b) Performance Incentive c) d) Form-based
- 11) With the classification of town planning, which types are not square or rectangular shaped?

a)	Dandaka	b)	Sarvatobhadra
``		1	N 1 1 1

- c) Karmuka d) Nandyavarka
- The town should be divided into different _____ so that suitable rules and 12) regulations can be framed for each of them.
 - a) Planning division
 - **Planning Units** b)
 - Sectors C)
 - Land use zones d)
- 13) Ekistics is the science dealing with _____
 - Synthesizing factor affecting human settlement a)
 - b) Using natural elements in planning
 - c) Socioeconomic study
 - **Diagnostic survey** d)
- A prefab construction material consisting of hollow EPS foam blocks that 14) are stacked and glued together on-site, creating the form that is filled with reinforcing bars and concrete.
 - Structural insulated panels (SIPs) a)
 - Insulating concrete forms (ICFS) b)
 - C) Steel framing
 - Concrete framing d)

- A piece of land divided into more than 8 parcels, each of which is to be 8) sold separately is called _____.
 - Layout a)

7)

9)

a) C)

- b) Subdivision of land
- C) Both 'a' and 'b'

Satellite town

Ekistics

radiating from a human settlement.

- d) Neither 'a' nor 'b'
- zoning is intended to provide a reward-based system to encourage development that meets established urban development goals.
- a) Euclidean
- Performance b)
- 10) Zoning regulates not the type of land use, but the form that land

Set | S means building houses along the routes of communications

Coat]	l	
Seat No.			Set	S
	B.E. (Part	- II) (CGPA) Examination Nov/Dec Civil Engineering TION PRACTICES AND TOWN PLA	-2019 ANNING	
Day & Time:	Date: Saturday, 23- 02:30 PM To 05:30 I	11-2019 PM	Max. Marks	: 56
Instru	ctions: 1) Question 2) Attempt a 2) Figures t	no.2 and Question no.6 is compulsory. any two out of Q.3 to Q.5. Attempt any two o right indicate full marks.	out of Q.7 to Q.9.	
		Section – I		
Q.2	Explain with suitablea) Necessity of Tob) Planning of Ch	e sketches. own Planning andigarh town		12
Q.3	Write detailed note of a) necessity of La b) Neighburhood	on. nd acquisition unit planning		08
Q.4	Explaina) Types of Surveb) Planning for the	ys for town planning. e Village.		08
Q.5	Write detailed note (a) Growth pattern b) Town aesthetic	on. of towns s		08
		Section – II		
Q.6	Explain with suitablea) Power Shovelb) Clamshell	e sketches.		12
Q.7	Write detailed note ofa) Mechanized cob) Cycle time calc	on. nstruction ulation for scraper		08
Q.8	Explaina) Types of hoistinb) Precast construction	ng equipments uction		08
Q.9	Write detailed note of a) Floating and dr b) Safety measure	on. edging equipment es in construction		08

Page	1	of	20

Instr	ructio	ns: 1)) Q. No. 1 is compulsory and shou book.	ıld be	solved in first 30 minutes	in answer
		3) Figures to the right indicate full r	narks	•	
		4) Illustrate your answer with suitat	ole sk	etch for theory questions.	
D			MCQ/Objective Typ	e Qu	estions	Marka: 11
Dura	ation: 3					
Q.1	1)	bse ti In ca a) b) c) d)	ne correct alternatives from the ase of physical and chemical mod preloaded admixtures are added to soil soil is reinforced none of these	optic ificatio	ons and rewrite the sente on soil is	ence. 14
	2)	Rolle a) c)	er most suitable for compacting sa Vibratory roller Pneumatic tired roller	andy s b) d)	soil is Smooth wheel roller Sheep foot roller	
	3)	Qua a) b) c) d)	lity of compaction in the field is co OMC is less and MDD is large OMC is large and MDD is less ZAV line is close to peak point o ZAV line is far away from peak p	nside f com oint c	paction curve	
	4)	In ca a) c)	ase of modified compaction test so single layer 3 layers	oil sar b) d)	nple is compacted in 2 layer 5 layer	·
	5)	For a d _e is a) c)	square grid, relation between spaces $d_e = 1.005S$ $d_e = 1.5S$	cing S b) d)	S and effective diameter $d_e = 1.05S$ $d_e = 1.13S$	
	6)	Suita a) c)	ability number of backfill material i Excellent Fair	s 25; b) d)	it implies backfill material Good None of these	is
	7)	Equi a) c)	ipotential line is parallel to Pervious boundary Flow line	b) d)	Impervious boundary None of these	
	8)	In P assu	riebe method the value of poisons umed to be	ratio	of stone column material	was

b)

d)

1/3

1/5

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil** Engineering

GROUND IMPROVEMENT TECHNIQUES

Day & Date: Monday, 25-11-2019

1/2

1/4

a) C)

Time: 02:30 PM To 05:30 PM

Seat

No.

SLR-FM-92

Max. Marks: 70

Set Ρ

No discontinuity is there in case of _____ due to lateral displacement of 9) soil. a) Stone column b) Sand drain C) PVD d) None of these 10) Coefficient of friction between soil and other material is given by _____. a) $\tan \varphi$ b) tan μ None of these d) C) $tan \delta$ 11) Synonym for penetration grouting is _ Intrusion grouting b) Jet grouting a) Permeation grouting d) Fracture grouting c) 12) Deep dynamic compaction is normally used if depth of improvement needed is _____. < 1m < 5m a) b) 5 – 10m d) None of these C) 13) Minimum factor of safety against sliding of wall is _____. 1.2 b) 1.5 a) C) 2.0 d) 2.5 14) Most suitable method of ground improvement when large boulders are present in the soil . Rapid Impact Compaction a) b) **Deep Dynamic Compaction** Vibro Compaction c) d) Blasting

SLR-FM-92

Set

		SLR-FM-	·92
Seat No.		Set	Ρ
		B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering GROUND IMPROVEMENT TECHNIQUES	
Day & Time: (Date 02:3	e: Monday, 25-11-2019 Max. Marks 0 PM To 05:30 PM	: 56
Instru	ctio	 ns: 1) Q. No. 5 & Q. No. 9 are compulsory. 2) Attempt any two questions from each section. 3) Figures to the right indicate full marks. 4) Illustrate your answer with suitable sketch for theory questions. 	
		Section - I	
Q.2	Wri [:] a) b) c) b)	te short notes. (Any Three) Classification of ground improvement techniques Blasting Deep well system Sand drain	09
Q.3	a)	What is the safe distance of a building from blasting location if the detonator used for blasting has mass of 10kg (equivalent to TNT) and Hopkinson's number is 0.105?	03
	b)	Calculate area improvement ratio and area replacement ratio for the stone column of diameter 0.8m spaced at 1.3m c/c in i) square grid ii) triangular grid	06
Q.4	a) b)	What is dewatering? What is purpose of dewatering during construction and post construction? With a neat sketch explain electro osmosis method of dewatering	04 05
Q.5	Site Soil C _v = with con:	investigation report for airport reveals following details. strata - soft clayey soil up to 10m followed by sand. soil properties = $1 \times 10^{-7} \text{ m}^2/\text{yr}$, $C_h = 1.5 \times 10^{-6} \text{m}^2/\text{yr}$. It is intended to use PVD system triangular grid. Design the system. [Time available to begin the struction after one year.]	10

Section - II

Q.6	Writ a) b) c) d)	e short notes. (Any Three) Soil nails Slope stabilization Grouting Reinforced earth	09
Q.7	a)	Discuss the thermal method of soil modification.	04
	b)	Explain lime stabilization mechanism in brief.	05
Q.8	a)	With a sketch explain grouting equipment.	04
	b)	What is grout monitoring? How monitoring is done.	05
Q.9	Desi $\gamma = Fy = Fy$	gn a reinforced earth wall of height 10m. Backfill Soil properties are $17 \text{kN/m}^3 \varphi = 35^\circ$. Galvanized steel ties are to be used for reinforcement = 267Mpa. Assume $\delta = 20^\circ$.	10

SLR-FM-92 Set P

SLR-FM-92 Set P



Day Time	& Date : 02:3	e: Mo 0 PM	nday, 25-11-2019 To 05:30 PM		Max. Mark	<s: 70<="" td=""></s:>
Insti	uctior	าร: 1)) Q. No. 1 is compulsory and sho book.	uld b	e solved in first 30 minutes in an	swer
		3) 4)) Figures to the right indicate full) Illustrate your answer with suita	mark ble s	ks. sketch for theory questions.	
			MCQ/Objective Ty	pe Q	uestions	
Dura	tion: 3	0 Mir	nutes		Mark	<s: 14<="" td=""></s:>
Q.1	Choo	ose tł	ne correct alternatives from the	e opt	ions and rewrite the sentence.	14
	1)	In Pi assu	riebe method the value of poison umed to be	s rati	io of stone column material was	
		a) c)	1/2 1/4	b) d)	1/3 1/5	
	2)	No c soil.	liscontinuity is there in case of		due to lateral displacement of	
		a) c)	Stone column PVD	b) d)	Sand drain None of these	
	3)	Coet a) c)	fficient of friction between soil an $\tan \varphi$	d oth b) d)	tan μ	
	4)	Syna	onym for penetration grouting is _	u)		
		a) c)	Intrusion grouting Permeation grouting	b) d)	Jet grouting Fracture grouting	
	5)	Dee need	p dynamic compaction is normall ded is	y use	ed if depth of improvement	
		a) c)	< 1m 5 – 10m	b) d)	< 5m None of these	
	6)	Mini	mum factor of safety against slid	ing o	f wall is	
		a) c)	2.0	d)	2.5	
	7)	Mos are p	t suitable method of ground impr present in the soil	overr	nent when large boulders	
		a) c)	Rapid Impact Compaction Vibro Compaction	b) d)	Deep Dynamic Compaction Blasting	
	8)	In ca a) b) c) d)	ase of physical and chemical mod preloaded admixtures are added to soil soil is reinforced none of these	difica	tion soil is	
	9)	Rolle a) c)	er most suitable for compacting s Vibratory roller Pneumatic tired roller	andy b) d)	/ soil is Smooth wheel roller Sheep foot roller	

Seat	
No.	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

Pneumatic tired roller C)

Set Q

10) Quality of compaction in the field is considered to be good if _____.

- a) OMC is less and MDD is large
- b) OMC is large and MDD is less
- c) ZAV line is close to peak point of compaction curve
- d) ZAV line is far away from peak point of compaction curve
- 11) In case of modified compaction test soil sample is compacted in _____.
 - a) single layer b) 2 layer
 - c) 3 layers d) 5 layer
- 12) For square grid, relation between spacing S and effective diameter d_e is _____.
 - a) $d_e = 1.005S$ b) $d_e = 1.05S$
 - c) $d_e = 1.5S$ d) $d_e = 1.13S$
- 13) Suitability number of backfill material is 25; it implies backfill material is _____.
 - a) Excellent
- b) Goodd) None of these
- c) Fair d)
- 14) Equipotential line is parallel to _____.
 - a) Pervious boundary
 - c) Flow line

b) Impervious boundary

SLR-FM-92

Set Q

d) None of these

		SLR-FM-	<u>92</u>
Seat No.		Set	Q
		B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering GROUND IMPROVEMENT TECHNIQUES	
Day & Time: (Date 02:3	e: Monday, 25-11-2019 Max. Marks 0 PM To 05:30 PM	: 56
Instru	ctio	 ns: 1) Q. No. 5 & Q. No. 9 are compulsory. 2) Attempt any two questions from each section. 3) Figures to the right indicate full marks. 4) Illustrate your answer with suitable sketch for theory questions. 	
		Section - I	
Q.2	Writ a) b) c) b)	te short notes. (Any Three) Classification of ground improvement techniques Blasting Deep well system Sand drain	09
Q.3	a)	What is the safe distance of a building from blasting location if the detonator used for blasting has mass of 10kg (equivalent to TNT) and Hopkinson's number is 0.105?	03
	b)	Calculate area improvement ratio and area replacement ratio for the stone column of diameter 0.8m spaced at 1.3m c/c in i) square grid ii) triangular grid	06
Q.4	a)	What is dewatering? What is purpose of dewatering during construction and post construction?	04
	b)	With a neat sketch explain electro osmosis method of dewatering.	05
Q.5	Site Soil C _v = with cons	investigation report for airport reveals following details. strata - soft clayey soil up to 10m followed by sand. soil properties = $1 \times 10^{-7} \text{ m}^2/\text{yr}$, $C_h = 1.5 \times 10^{-6} \text{m}^2/\text{yr}$. It is intended to use PVD system triangular grid. Design the system. [Time available to begin the struction after one year.]	10

		Section - II	
Q.6	Wri [:] a) b) c) d)	te short notes. (Any Three) Soil nails Slope stabilization Grouting Reinforced earth	09
Q.7	a) b)	Discuss the thermal method of soil modification. Explain lime stabilization mechanism in brief.	04 05
Q.8	a) b)	With a sketch explain grouting equipment. What is grout monitoring? How monitoring is done.	04 05
Q.9	Des γ = Fy =	ign a reinforced earth wall of height 10m. Backfill Soil properties are 17 kN/m ³ $\varphi = 35^{\circ}$. Galvanized steel ties are to be used for reinforcement = 267Mpa. Assume $\delta = 20^{\circ}$.	10

Set Q

SLR-FM-92 Set Q



action is normally us	ed if depth of improvement	
b) d)	< 5m None of these	
afety against sliding o b) d)	of wall is 1.5 2.5	
		Dago 11 of 20

GROUND IMPROVEMENT TECHNIQUES Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 3) Figures to the right indicate full marks.
- 4) Illustrate your answer with suitable sketch for theory questions.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- For square grid, relation between spacing S and effective diameter 1)
 - d_{ρ} is _____.

2.0

C)

Duration: 30 Minutes

a)	$d_e = 1.005S$	b)	$d_e = 1.05S$
c)	$d_e = 1.5S$	d)	$d_e = 1.13S$

Suitability number of backfill material is 25; it implies backfill material is . 2)

a)	Excellent	b)	Good
C)	Fair	d)	None of these

Equipotential line is parallel to _____. 3)

- Pervious boundary b) Impervious boundary a)
- Flow line None of these c) d)
- 4) In Priebe method the value of poisons ratio of stone column material was assumed to be _____. 1/2

a)	1/2	b)	1/3
C)	1/4	d)	1/5

- No discontinuity is there in case of _____ due to lateral displacement of 5) soil.
 - a) Stone column b) Sand drain C) PVD d) None of these

Coefficient of friction between soil and other material is given by _____. 6)

a) b) tan μ tan ø C) $tan \delta$ d) None of these

Synonym for penetration grouting is						
a)	Intrusion grouting	b)	Jet grouting			
c)	Permeation grouting	d)	Fracture grouting			
	Syn a) c)	Synonym for penetration groutinga) Intrusion groutingc) Permeation grouting	Synonym for penetration grouting isa)Intrusion groutingb)c)Permeation groutingd)			

- 8) Deep dynamic comp needed is .
 - a) < 1m c) 5 – 10m

9) Minimum factor of sa 1.2 a)

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering**

Max. Marks: 70

SLR-FM-92



Marks: 14

14

10) Most suitable method of ground improvement when large boulders are present in the soil ____ Rapid Impact Compaction b) **Deep Dynamic Compaction** a) c) Vibro Compaction d) Blasting 11) In case of physical and chemical modification soil is _____. preloaded a) b) admixtures are added to soil soil is reinforced C) d) none of these Roller most suitable for compacting sandy soil is _____. Vibratory roller b) Smooth wheel roller a) Pneumatic tired roller d) Sheep foot roller C) 13) Quality of compaction in the field is considered to be good if _____. OMC is less and MDD is large a) OMC is large and MDD is less b) C) ZAV line is close to peak point of compaction curve ZAV line is far away from peak point of compaction curve d)

- 14) In case of modified compaction test soil sample is compacted in .
 - 2 laver single layer b) a) 3 layers d) 5 layer C)

12)



		SLR-FM-	92	
Seat No.		Set	R	
	•	B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering GROUND IMPROVEMENT TECHNIQUES		
Day & Time: (Date 02:3	e: Monday, 25-11-2019 Max. Marks 0 PM To 05:30 PM	: 56	
Instru	ctio	 ns: 1) Q. No. 5 & Q. No. 9 are compulsory. 2) Attempt any two questions from each section. 3) Figures to the right indicate full marks. 4) Illustrate your answer with suitable sketch for theory questions. 		
		Section - I		
Q.2	Writ a) b) c) b)	te short notes. (Any Three) Classification of ground improvement techniques Blasting Deep well system Sand drain	09	
Q.3	a)	What is the safe distance of a building from blasting location if the detonator used for blasting has mass of 10kg (equivalent to TNT) and Hopkinson's number is 0.105?	03	
	b)	Calculate area improvement ratio and area replacement ratio for the stone column of diameter 0.8m spaced at 1.3m c/c in i) square grid ii) triangular grid	06	
Q.4	a)	What is dewatering? What is purpose of dewatering during construction and post construction?	04	
0.5	(a	with a neat sketch explain electro osmosis method of dewatering.	05	
Q.5 Site investigation report for airport reveals following details. Soil strata - soft clayey soil up to 10m followed by sand. soil properties $C_v = 1 \times 10^{-7} \text{ m}^2/\text{yr}$, $C_h = 1.5 \times 10^{-6} \text{m}^2/\text{yr}$. It is intended to use PVD system with triangular grid. Design the system. [Time available to begin the construction after one year.]				

			Set	R]	
	Section - II					
Q.6	Writ a) b) c) d)	te short notes. (Any Three) Soil nails Slope stabilization Grouting Reinforced earth		09		
Q.7	a) b)	Discuss the thermal method of soil modification. Explain lime stabilization mechanism in brief.		04 05		
Q.8	a) b)	With a sketch explain grouting equipment. What is grout monitoring? How monitoring is done.		04 05		
Q.9	Design a reinforced earth wall of height 10m. Backfill Soil properties are $\gamma = 17$ kN/m ³ $\varphi = 35^{\circ}$. Galvanized steel ties are to be used for reinforce $Fy = 267$ Mpa. Assume $\delta = 20^{\circ}$.			10		

Page **14** of **20**

SLR-FM-92 Set R



Seat No.							\$	Set	S
	•	E	B.E. (Part	- II) (CGPA) E	xamina	ati	on Nov/Dec-2019	L	
					ngineer	in • •	g		
Day &	Data	• Mo	GRU			I		Iorka	· 70
Time: ()2:30) PM	To 05:30 F	PM			IVIAX. I	//a/K5	. 70
Instru	ction	is: 1)	Q. No. 1 is	s compulsory and	should l	be	solved in first 30 minutes in	ansv	ver
		3)	book. Figures to	the right indicate	full mar	ks			
		4)	Illustrate y	our answer with	suitable	sk	etch for theory questions.		
				MCQ/Objective	е Туре С	Qu	estions		
Duratio	on: 3	0 Min	utes				N	<i>A</i> arks	: 14
Q.1 C	hoo ۱	se th	ficient of fri	alternatives fron	n the op and oth	tic he	ons and rewrite the senter r material is given by	ce.	14
	/	a)	$\tan \varphi$		b)		$\tan \mu$.•	
		c)	$tan \delta$		d)		None of these		
2	2)	Sync	onym for pe	enetration grouting	g is		 Lat manufic a		
		a) c)	Permeatio	n grouting	(d (b		Fracture grouting		
3	5)	Deep	o dynamic o	compaction is nor	rmally us	sec	l if depth of improvement		
-	,	need	led is		, , , , , , , , , , , , , , , , , , ,				
		a) c)	< 1m 5 – 10m		b) d)		< 5m None of these		
Δ)	0) Minir	num factor	of safety against	slidina c	۰ f	wall is		
•	/	a)	1.2	or barbty against	b)		1.5		
		c)	2.0		d)		2.5		
5	5)	Most	suitable m	ethod of ground i	improver	me	ent when large boulders		
		are p a)	Rapid Imp	act Compaction	b)		Deep Dynamic Compactio	n	
		c)	Vibro Com	paction	d)		Blasting		
6	5)	In ca	se of physi	cal and chemical	modifica	atio	on soil is		
		a) b)	admixture	s are added to so	bil				
		c)	soil is rein	forced					
		d)	none of th	ese					
7	')	Rolle	er most suit	able for compact	ing sand הא	y s	soil is		
		a) C)	Pneumatic	c tired roller	d)		Sheep foot roller		
8	5)	Qual	ity of comp	action in the field	l is consi	de	red to be good if		
		a) OMC is less and MDD is large							
		c)	ZAV line is	s close to peak po	coo Dint of CC	m	paction curve		
		d)	ZAV line is	s far away from n	eak noin	t c	If compaction curve		

Seat No.

ZAV line is far away from peak point of compaction curve u)
				Set S
9)	ln ca a) c)	ase of modified compaction test s single layer 3 layers	oil sa b) d)	mple is compacted in 2 layer 5 layer
10)	For d _e is a) c)	square grid, relation between space $d_e = 1.005S$ $d_e = 1.5S$	b) d)	S and effective diameter $d_e = 1.05S$ $d_e = 1.13S$
11)	Suita a) c)	ability number of backfill material Excellent Fair	is 25; b) d)	it implies backfill material is Good None of these
12)	Equ a) c)	ipotential line is parallel to Pervious boundary Flow line	b) d)	Impervious boundary None of these
13)	In P assu a) c)	riebe method the value of poisons umed to be 1/2 1/4	s ratio b) d)	o of stone column material was 1/3 1/5
14)	No c soil. a) c)	discontinuity is there in case of Stone column PVD	c b) d)	lue to lateral displacement of Sand drain None of these

		SLR-FM-	<mark>.</mark> 92				
Seat No.		Set	S				
	B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering GROUND IMPROVEMENT TECHNIQUES						
Day & Time: (Day & Date: Monday, 25-11-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM Max. Marks: 56						
Instru	ctio	 ns: 1) Q. No. 5 & Q. No. 9 are compulsory. 2) Attempt any two questions from each section. 3) Figures to the right indicate full marks. 4) Illustrate your answer with suitable sketch for theory questions. 					
		Section - I					
Q.2	Writ a) b) c) b)	te short notes. (Any Three) Classification of ground improvement techniques Blasting Deep well system Sand drain	09				
Q.3	a)	What is the safe distance of a building from blasting location if the detonator used for blasting has mass of 10kg (equivalent to TNT) and Hopkinson's number is 0.105?	03				
	b)	Calculate area improvement ratio and area replacement ratio for the stone column of diameter 0.8m spaced at 1.3m c/c in i) square grid ii) triangular grid	06				
Q.4	a) b)	What is dewatering? What is purpose of dewatering during construction and post construction? With a neat sketch explain electro osmosis method of dewatering.	04 05				
Q.5	b) With a neat sketch explain electro osmosis method of dewatering. 05 Q.5 Site investigation report for airport reveals following details. 10 Soil strata - soft clayey soil up to 10m followed by sand. soil properties $C_v = 1 \times 10^{-7} \text{ m}^2/\text{yr}$, $C_h = 1.5 \times 10^{-6} \text{m}^2/\text{yr}$. It is intended to use PVD system with triangular grid. Design the system. [Time available to begin the construction after one year.]						

			Set	S	1
		Section - II			1
Q.6	Writ a) b) c) d)	te short notes. (Any Three) Soil nails Slope stabilization Grouting Reinforced earth		09	
Q.7	a) b)	Discuss the thermal method of soil modification. Explain lime stabilization mechanism in brief.		04 05	
Q.8	a) b)	With a sketch explain grouting equipment. What is grout monitoring? How monitoring is done.		04 05	
Q.9	Design a reinforced earth wall of height 10m. Backfill Soil properties are $\gamma = 17$ kN/m ³ $\varphi = 35^{\circ}$. Galvanized steel ties are to be used for reinforcen $Fy = 267$ Mpa. Assume $\delta = 20^{\circ}$.				

SLR-FM-92 Set S



Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume any missing data suitably and mention it clearly

MCQ/Objective Type Questions

Marks: 14 **Duration: 30 Minutes** Q.1 Choose correct alternatives from the options and rewrite the sentence. 14 In Level of service 'A', the service provided to roadway traffic is . 1) Forced flow operations at low speeds a) b) Approaches unstable flow Zone of stable flow c) Free flow, with low volumes and high speed d) As per IRC:67-2001, a traffic sign indicating the Give Way on a road 2) should be of, a) Circular shape with white background and red border Triangular shape with white background and red border b) Triangular shape with red background and white border c) Circular shape with red background and white border d) Density of the traffic stream is measured in 3) a) Vehicles/hour b) Vehicles/Km c) No of vehicles d) Vehicles/Hour/Lane Which among the following is the fundamental equation of traffic flow? 4) q=k/vs q=kxvs a) b) v=qxk q=k²xvs C) d) When volume of the road reaches maximum flow or the capacity, the 5) volume capacity ratio approaches to a value of, _ a) 1.0 b) 1.5 0.0 d) 0.5 c) 6) The objects appear darker than the road surface, this principal is known as Silhouette a) b) Reverse silhouette d) C) Lamps Head lights The cross roads with one-way regulation on one road and other cross 7) road with two way, the total conflict points are _ a) 6 b) 24 11 d) 28 c) 8) It was noted that on a section of road, the free speed was 80kmph and the jam density was 70vpkm. The maximum flow in vph that could be expected on this road is . 800 a) b) 1400 2800 5600 c) d)

Seat No.

Max. Marks: 70

Set

- A traffic stream in a particular direction of a two lane road is moving with a 9) constant speed of 50 kmph, with an average headway of 2.52 seconds. The longitudinal distance between two consecutive vehicles is _____.
 - 30m a) b) 35m 38m c)
 - d) 42m
- In signal design as per Indian Roads Congress specifications, if the sum 10) of the ratios of normal flows to saturation flow of two directional traffic flows is 0.50 and the total lost time per cycle is 10 seconds, the optimum cycle length in seconds is _____.
 - 100 a) b) 80
 - 60 40 c) d)
- 11) Two broken yellow line marking at center of road indicates _____.
 - No passing allowed on both side a)
 - Passing allowed on one side b)
 - Passing allowed on both side c)
 - Passing allowed only for left side vehicle d)
- The average spacing between vehicles in traffic stream is 50m. The 12) density (in veh/km) of stress is ____
 - a) 40 b) 50 C) 20 d) 30
- A vehicle travelling at a speed of 30kmph was stopped by applying brakes 13) and the skid marks were 5.8m, average skid resistance, 'f' of the pavement surface is, _____.
 - a) 0.61 b) 0.55 C) 0.15 d) 0.99
- 14) An isolated three-phase traffic signal is designed by Webster's method. The critical flow ratios for three phases are 0.2, 0.3 and 0.25 respectively and lost time per phase is 4 seconds. The optimum cycle length (in sec)
 - is, _ a) 92 82 b) C) 62 d) 42

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No.2 and Q. No. 6 are compulsory;

- 2) Answer any two questions from each section.
- 3) Figures to the right indicate full marks.
- 4) Assume any missing data suitably and mention it clearly.

Section - I

Q.2 Attempt any two of the following questions.

- What are the objects and scope of traffic engineering? Explain briefly. a)
- Mention the methods available for OD survey. Explain in detail about home b) questionnaire survey.
- A vehicle of weight 2.0 tonne skids through a distance equal to 40m before c) colliding with another parked vehicle of weight 1.0 tonne. After collision both the vehicles skid through a distance equal to 12m before stopping. Compute the initial speed of the moving vehicle. Assume average coefficient of friction as 0.5.

Q.3 Attempt the following questions.

- Discuss the various types of on street parking with their advantages and a) disadvantages.
- **b)** Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.

Q.4 Attempt the following questions.

- Mention the methods of conducting spot speed studies. What are the a) various objects and applications of spot speed studies? Explain briefly.
- Write a short note on b)
 - 1) Level of Service
 - 2) Passenger Car Unit
 - 3) Collision and Condition Diagram

Q.5 Attempt the following questions.

20 25

30

From an in-out survey conducted for a parking area consisting of 40 bays, the 10 initial count was found to be 25. Table-1 gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the Table-1 below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

60

3

5

2

In-out survey data			In-out survey data		In-out	survey	data
Time	In	Out	Time	In	Out		
5	3	2	35	2	7		
10	2	4	40	4	2		
15	4	2	45	6	4		
20	5	4	50	4	1		
25	7	S	55	S	3		

2

8

Table-1-In-Out Survey data

Max. Marks: 56

10

80

10

SLR-FM-93

Seat No.

Section - II

SLR-FM-93

Set

80 Q.6 Attempt any two of the following questions. Explain regulations concerning to the a) 1) Drivers 2) speed limits in Rural and Urban area Explain the purpose of below traffic control devices with neat sketches. b) 1) Hazard Markers 2) Roadway Delineators 3) Object Markers 4) Rumble strips Write a short note on ITS applications in urban transport system. C) Q.7 Attempt the following questions. 10 Write a brief note on applications of a) 1) Pneumatic Tube Detectors & Inductive Detector Loop (IDE) Video Image Detection & Infra-red Sensors 2) b) Explain the function of 1) Accelerating and De-accelerating lanes 2) **Right protect lanes** Q.8 Attempt the following questions. 10 Explain the difference between fixed time signals and vehicle actuated a) signals. Explain the application of b) 1) Bump Integrator 2) Portable Skid Resistance Tester 10 Q.9 Attempt the following questions. Define, cycle, Interval and Phase. The average normal flow of traffic on cross

roads 1 and 2 during design period are 440 and 280PCU per hour, the saturation flow values on these roads are estimated as 1300 and 1100 PCU per hour respectively. The all-red time required for pedestrian crossing is 12 sec. Design two phase traffic signal with pedestrian crossing by Webster's method. Sketch the phase diagram.

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume any missing data suitably and mention it clearly

MCQ/Objective Type Questions

Choose correct alternatives from the options and rewrite the sentence. It was noted that on a section of road, the free speed was 80kmph and the 1) jam density was 70vpkm. The maximum flow in vph that could be expected on this road is .

- 800 a) b) 1400 2800 d) 5600 c)
- A traffic stream in a particular direction of a two lane road is moving with a 2) constant speed of 50 kmph, with an average headway of 2.52 seconds.

The longitudinal distance between two consecutive vehicles is _____.

- 30m b) 35m a)
- c) 38m d) 42m
- In signal design as per Indian Roads Congress specifications, if the sum 3) of the ratios of normal flows to saturation flow of two directional traffic flows is 0.50 and the total lost time per cycle is 10 seconds, the optimum cycle length in seconds is _____.
 - 100 b) 80 a) C) 60 d) 40
- Two broken yellow line marking at center of road indicates _____. 4)
 - No passing allowed on both side a)
 - Passing allowed on one side b)
 - Passing allowed on both side C)
 - Passing allowed only for left side vehicle d)
- 5) The average spacing between vehicles in traffic stream is 50m. The density (in veh/km) of stress is _
 - 40 b) 50 a)
 - 20 30 c) d)
- A vehicle travelling at a speed of 30kmph was stopped by applying brakes 6) and the skid marks were 5.8m, average skid resistance, 'f' of the pavement surface is, _____.
 - a) 0.61 0.55 b) 0.15 0.99 c) d)

Seat

No.

Q.1

Max. Marks: 70

Marks: 14

14

SLR-FM-93

			SLR-FM-9	3
			Set C	2
7)	An isolated three-phase traffic signal The critical flow ratios for three phase and lost time per phase is 4 seconds. is, a) 92 c) 62	is des s are The b) d)	signed by Webster's method. 0.2, 0.3 and 0.25 respectively optimum cycle length (in sec) 82	
8)	 In Level of service 'A', the service pro a) Forced flow operations at low sp b) Approaches unstable flow c) Zone of stable flow d) Free flow, with low volumes and 	vided eeds high	to roadway traffic is	
9)	 As per IRC:67-2001, a traffic sign indishould be of, a) Circular shape with white backg b) Triangular shape with white backg c) Triangular shape with red backg d) Circular shape with red backgroup 	catin rounc kgrou rounc und a	g the Give Way on a road d and red border and and red border d and white border and white border	
10)	Density of the traffic stream is measua) Vehicles/hourc) No of vehicles	red in b) d)	n Vehicles/Km Vehicles/Hour/Lane	
11)	Which among the following is the fund a) q=k/vs c) v=qxk	dame b) d)	ntal equation of traffic flow? q=kxvs q=k ² xvs	
12)	When volume of the road reaches may volume capacity ratio approaches to a a) 1.0 c) 0.0	iximu a valu b) d)	m flow or the capacity, the ue of, 1.5 0.5	
13)	The objects appear darker than the roas a) Silhouette c) Lamps	bad su b) d)	urface, this principal is known Reverse silhouette Head lights	
14)	The cross roads with one-way regulat road with two way, the total conflict po a) 6 c) 11	ion o bints a b) d)	n one road and other cross are 24 28	

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No.2 and Q. No. 6 are compulsory;

- 2) Answer any two questions from each section.
- 3) Figures to the right indicate full marks.
- 4) Assume any missing data suitably and mention it clearly.

Section - I

Attempt any two of the following questions. Q.2

- What are the objects and scope of traffic engineering? Explain briefly. a)
- Mention the methods available for OD survey. Explain in detail about home b) questionnaire survey.
- A vehicle of weight 2.0 tonne skids through a distance equal to 40m before c) colliding with another parked vehicle of weight 1.0 tonne. After collision both the vehicles skid through a distance equal to 12m before stopping. Compute the initial speed of the moving vehicle. Assume average coefficient of friction as 0.5.

Q.3 Attempt the following questions.

- Discuss the various types of on street parking with their advantages and a) disadvantages.
- **b)** Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.

Q.4 Attempt the following questions.

- Mention the methods of conducting spot speed studies. What are the a) various objects and applications of spot speed studies? Explain briefly.
- Write a short note on b)
 - 1) Level of Service
 - 2) Passenger Car Unit
 - 3) Collision and Condition Diagram

Q.5 Attempt the following questions.

Time

10

15

20

25

30

7

8

3

2

From an in-out survey conducted for a parking area consisting of 40 bays, the 10 initial count was found to be 25. Table-1 gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the Table-1 below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

55

60

Out

7

2

4

1

3

5

3

2

In-ou	t survey	data	In-out survey of		data
ime	In	Out	Time	In	O
5	3	2	35	2	7
10	2	4	40	4	2
15	4	2	45	6	4
20	5	4	50	4	1

Table-1-In-Out Survey data

Max. Marks: 56

10

80

10

SLR-FM-93

Seat

No.

Section - II

80 Q.6 Attempt any two of the following questions. Explain regulations concerning to the a) 1) Drivers 2) speed limits in Rural and Urban area Explain the purpose of below traffic control devices with neat sketches. b) 1) Hazard Markers 2) Roadway Delineators 3) Object Markers 4) Rumble strips Write a short note on ITS applications in urban transport system. C) Q.7 Attempt the following questions. 10 Write a brief note on applications of a) 1) Pneumatic Tube Detectors & Inductive Detector Loop (IDE) Video Image Detection & Infra-red Sensors 2) b) Explain the function of 1) Accelerating and De-accelerating lanes 2) **Right protect lanes** Q.8 Attempt the following questions. 10 Explain the difference between fixed time signals and vehicle actuated a) signals. Explain the application of b) 1) Bump Integrator 2) Portable Skid Resistance Tester 10 Q.9 Attempt the following questions. Define, cycle, Interval and Phase. The average normal flow of traffic on cross

Define, cycle, Interval and Phase. The average normal flow of traffic on cross roads 1 and 2 during design period are 440 and 280PCU per hour, the saturation flow values on these roads are estimated as 1300 and 1100 PCU per hour respectively. The all-red time required for pedestrian crossing is 12 sec. Design two phase traffic signal with pedestrian crossing by Webster's method. Sketch the phase diagram.

SLR-FM-93

Set Q

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume any missing data suitably and mention it clearly

MCQ/Objective Type Questions

Dura	tion: 3	30 Minutes			Marks		
Q.1	Chc 1)	When volume of the road reach volume capacity ratio approach a) 1.0 c) 0.0	he options es maximur es to a valu- b) d)	and rewrite the senter m flow or the capacity, e of, 1.5 0.5	ence. the		
	2)	The objects appear darker than as a) Silhouette c) Lamps	the road su b) d)	urface, this principal is Reverse silhouette Head lights	known		
	3)	The cross roads with one-way r road with two way, the total con a) 6 c) 11	egulation or flict points a b) d)	n one road and other c are 24 28	ross		
	4)	It was noted that on a section of jam density was 70vpkm. The n expected on this road is a) 800 c) 2800	f road, the fi naximum flo _b) d)	ree speed was 80kmpl ow in vph that could be 1400 5600	n and the		
	5)	A traffic stream in a particular d constant speed of 50 kmph, with The longitudinal distance betwe a) 30m c) 38m	irection of a h an averag en two cons b) d)	two lane road is movin the headway of 2.52 sec secutive vehicles is 35m 42m	ng with a conds. 		
	6)	In signal design as per Indian Roads Congress specifications, if the sum of the ratios of normal flows to saturation flow of two directional traffic flows is 0.50 and the total lost time per cycle is 10 seconds, the optimum cycle length in seconds is a) 100 b) 80 c) 60 d) 40					
	7)	 Two broken yellow line marking a) No passing allowed on bot b) Passing allowed on one sid c) Passing allowed on both sid d) Passing allowed only for let 	at center of h side de ide eft side vehic	f road indicates			

Seat No.



Set

Max. Marks: 70

14

14

- Set
- 8) The average spacing between vehicles in traffic stream is 50m. The density (in veh/km) of stress is ____
 - 40 50 a) b) 20 d) 30 c)
- 9) A vehicle travelling at a speed of 30kmph was stopped by applying brakes and the skid marks were 5.8m, average skid resistance, 'f' of the pavement surface is, _____.
 - b) 0.55 a) 0.61
 - 0.15 d) 0.99 C)
- An isolated three-phase traffic signal is designed by Webster's method. 10) The critical flow ratios for three phases are 0.2, 0.3 and 0.25 respectively and lost time per phase is 4 seconds. The optimum cycle length (in sec) is,
 - 92 a) b) 82
 - 42 c) 62 d)
- In Level of service 'A', the service provided to roadway traffic is 11)
 - Forced flow operations at low speeds a)
 - b) Approaches unstable flow
 - Zone of stable flow C)
 - Free flow, with low volumes and high speed d)
- As per IRC:67-2001, a traffic sign indicating the Give Way on a road 12) should be of,
 - Circular shape with white background and red border a)
 - Triangular shape with white background and red border b)
 - Triangular shape with red background and white border c)
 - d) Circular shape with red background and white border
- Density of the traffic stream is measured in 13)
 - Vehicles/hour a)

- Vehicles/Km
- No of vehicles c)
- b) d) Vehicles/Hour/Lane
- Which among the following is the fundamental equation of traffic flow? 14)
 - a=k/vs a)

q=kxvs b)

v=qxk c)

 $q = k^2 x v s$ d)

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019

Civil Engineering TRAFFIC ENGINEERING & CONTROL

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No.2 and Q. No. 6 are compulsory;

- 2) Answer any two questions from each section.
- 3) Figures to the right indicate full marks.
- 4) Assume any missing data suitably and mention it clearly.

Section - I

Q.2 Attempt any two of the following questions.

- What are the objects and scope of traffic engineering? Explain briefly. a)
- Mention the methods available for OD survey. Explain in detail about home b) questionnaire survey.
- A vehicle of weight 2.0 tonne skids through a distance equal to 40m before c) colliding with another parked vehicle of weight 1.0 tonne. After collision both the vehicles skid through a distance equal to 12m before stopping. Compute the initial speed of the moving vehicle. Assume average coefficient of friction as 0.5.

Q.3 Attempt the following questions.

- Discuss the various types of on street parking with their advantages and a) disadvantages.
- **b)** Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.

Q.4 Attempt the following questions.

- Mention the methods of conducting spot speed studies. What are the a) various objects and applications of spot speed studies? Explain briefly.
- Write a short note on b)
 - 1) Level of Service
 - 2) Passenger Car Unit
 - 3) Collision and Condition Diagram

Q.5 Attempt the following questions.

From an in-out survey conducted for a parking area consisting of 40 bays, the 10 initial count was found to be 25. Table-1 gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the Table-1 below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

In-ou	t survey	data	In-out survey dat		data
Time	In	Out	Time	In	Out
5	3	2	35	2	7
10	2	4	40	4	2
15	4	2	45	6	4
20	5	4	50	4	1
25	7	3	55	3	3
30	8	2	60	2	5

Table-1-In-Out Survey data

Max. Marks: 56

10

80

10

SLR-FM-93

Seat No.

Section - II

SLR-FM-93

Set

80 Q.6 Attempt any two of the following questions. Explain regulations concerning to the a) 1) Drivers 2) speed limits in Rural and Urban area Explain the purpose of below traffic control devices with neat sketches. b) 1) Hazard Markers 2) Roadway Delineators 3) Object Markers 4) Rumble strips Write a short note on ITS applications in urban transport system. C) Attempt the following questions. 10 Q.7 Write a brief note on applications of a) 1) Pneumatic Tube Detectors & Inductive Detector Loop (IDE) 2) Video Image Detection & Infra-red Sensors b) Explain the function of 1) Accelerating and De-accelerating lanes 2) **Right protect lanes** Q.8 Attempt the following questions. 10 Explain the difference between fixed time signals and vehicle actuated a) signals. Explain the application of b) 1) Bump Integrator 2) Portable Skid Resistance Tester 10 Q.9 Attempt the following questions. Define, cycle, Interval and Phase. The average normal flow of traffic on cross

Define, cycle, Interval and Phase. The average normal flow of traffic on cross roads 1 and 2 during design period are 440 and 280PCU per hour, the saturation flow values on these roads are estimated as 1300 and 1100 PCU per hour respectively. The all-red time required for pedestrian crossing is 12 sec. Design two phase traffic signal with pedestrian crossing by Webster's method. Sketch the phase diagram.

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Q.1

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.

- 2) Figures to the right indicate full marks.
- 3) Assume any missing data suitably and mention it clearly

MCQ/Objective Type Questions

Choose correct alternatives from the options and rewrite the sentence. In signal design as per Indian Roads Congress specifications, if the sum 1) of the ratios of normal flows to saturation flow of two directional traffic flows is 0.50 and the total lost time per cycle is 10 seconds, the optimum cycle length in seconds is _____.

- 100 80 a) b)
- C) 60 d) 40
- 2) Two broken yellow line marking at center of road indicates _____.
 - No passing allowed on both side a)
 - Passing allowed on one side b)
 - Passing allowed on both side c)
 - Passing allowed only for left side vehicle d)
- The average spacing between vehicles in traffic stream is 50m. The 3) density (in veh/km) of stress is _____.

a)	40	b)	50
\sim	20	d)	20

- 20 C) d) 30
- A vehicle travelling at a speed of 30kmph was stopped by applying brakes 4) and the skid marks were 5.8m, average skid resistance, 'f' of the pavement surface is, _____.
 - 0.61 a) b) 0.55 C) 0.15 d) 0.99
- An isolated three-phase traffic signal is designed by Webster's method. 5) The critical flow ratios for three phases are 0.2, 0.3 and 0.25 respectively and lost time per phase is 4 seconds. The optimum cycle length (in sec) is,

·•, _			
a)	92	b)	82
C)	62	d)	42

- 6) In Level of service 'A', the service provided to roadway traffic is _____.
 - Forced flow operations at low speeds a)
 - Approaches unstable flow b)
 - Zone of stable flow C)
 - Free flow, with low volumes and high speed d)

SLR-FM-93

Max. Marks: 70

14

Marks: 14

	SLR-FM-93
	Set S
7)	 As per IRC:67-2001, a traffic sign indicating the Give Way on a road should be of, a) Circular shape with white background and red border b) Triangular shape with white background and red border c) Triangular shape with red background and white border d) Circular shape with red background and white border
8)	Density of the traffic stream is measured ina) Vehicles/hourb) Vehicles/Kmc) No of vehiclesd) Vehicles/Hour/Lane
9)	Which among the following is the fundamental equation of traffic flow? a) q=k/vs b) q=kxvs c) v=qxk d) q=k ² xvs
10)	When volume of the road reaches maximum flow or the capacity, the volume capacity ratio approaches to a value of, a) 1.0 b) 1.5 c) 0.0 d) 0.5
11)	The objects appear darker than the road surface, this principal is known as a) Silhouette b) Reverse silhouette c) Lamps d) Head lights
12)	The cross roads with one-way regulation on one road and other cross road with two way, the total conflict points are a) 6 b) 24 c) 11 d) 28
13)	It was noted that on a section of road, the free speed was 80kmph and the jam density was 70vpkm. The maximum flow in vph that could be expected on this road is a) 800 b) 1400 c) 2800 d) 5600
14)	A traffic stream in a particular direction of a two lane road is moving with a constant speed of 50 kmph, with an average headway of 2.52 seconds. The longitudinal distance between two consecutive vehicles is

- a) 30m b) 35m
- c) 38m d) 42m

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No.2 and Q. No. 6 are compulsory;

- 2) Answer any two questions from each section.
- 3) Figures to the right indicate full marks.
- 4) Assume any missing data suitably and mention it clearly.

Section - I

Attempt any two of the following questions. Q.2

- What are the objects and scope of traffic engineering? Explain briefly. a)
- Mention the methods available for OD survey. Explain in detail about home b) questionnaire survey.
- A vehicle of weight 2.0 tonne skids through a distance equal to 40m before c) colliding with another parked vehicle of weight 1.0 tonne. After collision both the vehicles skid through a distance equal to 12m before stopping. Compute the initial speed of the moving vehicle. Assume average coefficient of friction as 0.5.

Q.3 Attempt the following questions.

- Discuss the various types of on street parking with their advantages and a) disadvantages.
- b) Define the term capacity. Explain terms basic capacity, possible capacity and practical capacity.

Q.4 Attempt the following questions.

- Mention the methods of conducting spot speed studies. What are the a) various objects and applications of spot speed studies? Explain briefly.
- Write a short note on b)
 - 1) Level of Service
 - 2) Passenger Car Unit
 - 3) Collision and Condition Diagram

Q.5 Attempt the following questions.

From an in-out survey conducted for a parking area consisting of 40 bays, the 10 initial count was found to be 25. Table-1 gives the result of the survey. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the Table-1 below. Find the accumulation, total parking load, average occupancy and efficiency of the parking lot.

In-ou	t survey	data	In-out survey da		
Time	In	Out	Time	In	Out
5	3	2	35	2	7
10	2	4	40	4	2
15	4	2	45	6	4
20	5	4	50	4	1
25	7	3	55	3	3
30	8	2	60	2	5

Table-1-In-Out Survey data

Max. Marks: 56

10

80

10

SLR-FM-93

Seat No.

Section - II

SLR-FM-93

Set

80 Q.6 Attempt any two of the following questions. Explain regulations concerning to the a) 1) Drivers 2) speed limits in Rural and Urban area Explain the purpose of below traffic control devices with neat sketches. b) 1) Hazard Markers 2) Roadway Delineators 3) Object Markers 4) Rumble strips Write a short note on ITS applications in urban transport system. C) Attempt the following questions. 10 Q.7 Write a brief note on applications of a) 1) Pneumatic Tube Detectors & Inductive Detector Loop (IDE) 2) Video Image Detection & Infra-red Sensors b) Explain the function of 1) Accelerating and De-accelerating lanes 2) **Right protect lanes** Q.8 Attempt the following questions. 10 Explain the difference between fixed time signals and vehicle actuated a) signals. Explain the application of b) 1) Bump Integrator 2) Portable Skid Resistance Tester 10 Q.9 Attempt the following questions. Define, cycle, Interval and Phase. The average normal flow of traffic on cross

Define, cycle, Interval and Phase. The average normal flow of traffic on cross roads 1 and 2 during design period are 440 and 280PCU per hour, the saturation flow values on these roads are estimated as 1300 and 1100 PCU per hour respectively. The all-red time required for pedestrian crossing is 12 sec. Design two phase traffic signal with pedestrian crossing by Webster's method. Sketch the phase diagram.

Set

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** INFRASTRUCTURAL ENGINEERING

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes In Answer Book.

- 2) Figure on right indicates full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 (Each MCQ questions carries 2 marks)
 - Which of the following is not role of government in Public Private 1) Partnership?
 - a) Ensure transparency
 - Expertise and innovation b)
 - Ensure value for money c)
 - Identify needs in terms of output d)
 - 2) Which of the following is role of private sector in Public Private Partnership?
 - Access to private finance a)
 - Providing the facility & service b)
 - Sufficient return to investors c)
 - All of the above d)
 - 3) Which of the following is not type of contract?
 - Service contracts a)
 - Design build b)

a)

- Lease-develop-Operate or Buy C)
- Lease-develop-Operate and Buy d)
- 4) Which of the following is not one of the key challenges for sustainability?
 - Water Waste b)
 - Energy Rural development C) d)
- What is meant by the term BOO ____ 5)
 - Build Operate Own a)
 - Build Own Operate **Building Own Operate** C) d)
- Which of the following is suitable as VGF scheme? 6)
 - Viability Gap Funding scheme a)
 - Volatile Gap Funding scheme b)
 - Viability Gap Finance scheme C)
 - Volatile Growth Funding scheme d)
- Which of the following is correct term for DBFM? 7)
 - **Design Build Finance Maintain** a)
 - **Design Build Finance Manage** b)
 - **Design Building Finance Maintain** C)
 - **Develop Build Finance Manage** d)

Max. Marks: 70



Marks: 14

- **Build Opt Operate**
- b)

Day & Time:	& Date: Monday, 25-11-2019 : 02:30 PM To 05:30 PM	Max. Marks:
Instru	 uctions: 1) Q. No. 2 is compulsory. Solve any three questions from S 2) Q. No. 6 is compulsory. Solve any three questions from S 3) Assume necessary data if required and mention it clearly 4) Figures to right indicate full marks. 	Section - I. Section - II.
	Section I	
Q.2	State the major problems with the transport sector in India?	
Q.3	Explain the challenges in privatization of water supply.	
Q.4	What are the points to be considered in Public Private Partnership to the public interest?	o protect
Q.5	Explain in detail project management execution activities?	
	Section –II	
Q.6	Draw and explain a schematic diagram of work flow of five phase pr management.	oject
Q.7	Explain the BOT (Annuity) model?	
Q.8	Explain the role of asset management in risk reduction?	

What are the main advantages of adopting sustainability principles for building

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering INFRASTRUCTURAL ENGINEERING

Da Tir

Seat No.

Q.9

& infrastructure?

SLR-FM-94



56

10

09

09

09

10

09

09

09

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering INFRASTRUCTURAL ENGINEERING**

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes In Answer Book.

- 2) Figure on right indicates full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

C)

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 (Each MCQ questions carries 2 marks)
 - What is meant by the term BOO 1)
 - Build Operate Own a) Build Own Operate
 - b) d) **Building Own Operate**
 - 2) Which of the following is suitable as VGF scheme?
 - Viability Gap Funding scheme a)
 - Volatile Gap Funding scheme b)
 - Viability Gap Finance scheme c)
 - Volatile Growth Funding scheme d)
 - Which of the following is correct term for DBFM? 3)
 - **Design Build Finance Maintain** a)
 - b) **Design Build Finance Manage**
 - **Design Building Finance Maintain** c)
 - **Develop Build Finance Manage** d)
 - Which of the following is not role of government in Public Private 4) Partnership?
 - Ensure transparency a)
 - Expertise and innovation b)
 - Ensure value for money c)
 - Identify needs in terms of output d)
 - 5) Which of the following is role of private sector in Public Private Partnership?
 - Access to private finance a)
 - Providing the facility & service b)
 - Sufficient return to investors c)
 - All of the above d)
 - 6) Which of the following is not type of contract?
 - a) Service contracts
 - b) Design build
 - Lease-develop-Operate or Buy c)
 - Lease-develop-Operate and Buy d)
 - Which of the following is not one of the key challenges for sustainability? 7)
 - Water
 - c) Energy

a)

- Waste b)
- Rural development d)

Max. Marks: 70

Set

Seat No.

Marks: 14

Build Opt Operate

	INFRASTRUCTURAL ENGINEERING	
Day & Time:	Date: Monday, 25-11-2019 Max. Max. Max. Max. Max. Max. Max. Max.	/larks: 56
Instru	 actions: 1) Q. No. 2 is compulsory. Solve any three questions from Section - 2) Q. No. 6 is compulsory. Solve any three questions from Section - 3) Assume necessary data if required and mention it clearly 4) Figures to right indicate full marks. 	· I. - II.
	Section I	
Q.2	State the major problems with the transport sector in India?	10
Q.3	Explain the challenges in privatization of water supply.	09
Q.4	What are the points to be considered in Public Private Partnership to protect the public interest?	t 09
Q.5	Explain in detail project management execution activities?	09
	Section –II	
Q.6	Draw and explain a schematic diagram of work flow of five phase project management.	10

Explain the BOT (Annuity) model? Q.7 09 Q.8 Explain the role of asset management in risk reduction? 09 09

What are the main advantages of adopting sustainability principles for building Q.9 & infrastructure?

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil** Engineering

SLR-FM-94

Set

Q

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering INFRASTRUCTURAL ENGINEERING

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes In Answer Book.

- 2) Figure on right indicates full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 (Each MCQ questions carries 2 marks)
 - 1) Which of the following is not type of contract?
 - a) Service contracts
 - b) Design build
 - c) Lease-develop-Operate or Buy
 - d) Lease-develop-Operate and Buy
 - 2) Which of the following is not one of the key challenges for sustainability?
 - a) Water b) Waste
 - c) Energy d) Rural development
 - What is meant by the term BOO _____
 - a) Build Operate Own b) Build Opt Operate
 - c) Build Own Operate d) Building Own Operate
 - 4) Which of the following is suitable as VGF scheme?
 - a) Viability Gap Funding scheme
 - b) Volatile Gap Funding scheme
 - c) Viability Gap Finance scheme
 - d) Volatile Growth Funding scheme
 - 5) Which of the following is correct term for DBFM?
 - a) Design Build Finance Maintain
 - b) Design Build Finance Manage
 - c) Design Building Finance Maintain
 - d) Develop Build Finance Manage
 - 6) Which of the following is not role of government in Public Private Partnership?
 - a) Ensure transparency
 - b) Expertise and innovation
 - c) Ensure value for money
 - d) Identify needs in terms of output
 - 7) Which of the following is role of private sector in Public Private Partnership?
 - a) Access to private finance
 - b) Providing the facility & service
 - c) Sufficient return to investors
 - d) All of the above

Max. Marks: 70

Marks: 14

Set R

	Civil Engineering	
Day & Time:	& Date: Monday, 25-11-2019 : 02:30 PM To 05:30 PM	Max. Marks
Instru	 uctions: 1) Q. No. 2 is compulsory. Solve any three questions from 2) Q. No. 6 is compulsory. Solve any three questions from 3) Assume necessary data if required and mention it clean 4) Figures to right indicate full marks. 	om Section - I. om Section - II. early
	Section I	
Q.2	State the major problems with the transport sector in India?	
Q.3	Explain the challenges in privatization of water supply.	
Q.4	What are the points to be considered in Public Private Partnersl the public interest?	nip to protect
Q.5	Explain in detail project management execution activities?	
	Section –II	
Q.6	Draw and explain a schematic diagram of work flow of five phase management.	se project
Q.7	Explain the BOT (Annuity) model?	

What are the main advantages of adopting sustainability principles for building

Explain the role of asset management in risk reduction?

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019

& infrastructure?

s: 56

SLR-FM-94

Set

R

10

09

09

09

10

09

09

09

Seat No.

Q.8

Q.9

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering** INFRASTRUCTURAL ENGINEERING

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes In Answer Book.

- 2) Figure on right indicates full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 (Each MCQ questions carries 2 marks)
 - Which of the following is suitable as VGF scheme? 1)
 - Viability Gap Funding scheme a)
 - b) Volatile Gap Funding scheme
 - Viability Gap Finance scheme c)
 - Volatile Growth Funding scheme d)
 - 2) Which of the following is correct term for DBFM?
 - Design Build Finance Maintain a)
 - **Design Build Finance Manage** b)
 - Design Building Finance Maintain c)
 - **Develop Build Finance Manage** d)
 - Which of the following is not role of government in Public Private 3) Partnership?
 - Ensure transparency a)
 - Expertise and innovation b)
 - Ensure value for money C)
 - Identify needs in terms of output d)
 - 4) Which of the following is role of private sector in Public Private Partnership?
 - Access to private finance a)
 - Providing the facility & service b)
 - Sufficient return to investors c)
 - d) All of the above
 - Which of the following is not type of contract? 5)
 - Service contracts a)
 - Design build b)

a)

a)

C)

- Lease-develop-Operate or Buy c)
- Lease-develop-Operate and Buy d)
- Which of the following is not one of the key challenges for sustainability? 6)
 - Waste Water b)
 - Energy d) Rural development C)
- What is meant by the term BOO _ 7) Build Operate Own
- **Build Opt Operate** b)
- Build Own Operate **Building Own Operate** d)

Max. Marks: 70

Set

Marks: 14

	INFRASTRUCTURAL ENGINEERING	
Day & Time:	Date: Monday, 25-11-2019 02:30 PM To 05:30 PM	Max. Mar
Instru	 actions: 1) Q. No. 2 is compulsory. Solve any three questions from 2) Q. No. 6 is compulsory. Solve any three questions from 3) Assume necessary data if required and mention it clear 4) Figures to right indicate full marks. 	m Section - I. m Section - II. arly
	Section I	
Q.2	State the major problems with the transport sector in India?	
Q.3	Explain the challenges in privatization of water supply.	
Q.4	What are the points to be considered in Public Private Partnershi the public interest?	p to protect
Q.5	Explain in detail project management execution activities?	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil** Engineering ...

ks: 56

- Section –II
- Draw and explain a schematic diagram of work flow of five phase project Q.6 10 management. Explain the BOT (Annuity) model? Q.7 09 Q.8 Explain the role of asset management in risk reduction? 09
- What are the main advantages of adopting sustainability principles for building Q.9 09 & infrastructure?

Seat No.

SLR-FM-94

Set S

10

09

09

09

.

Day & Time	& Date : 02:30	e: Mor D PM	nday, 25-11-2019 To 05:30 PM		Max. Mark	s: 70
Instr	uctior	n s: 1) 2) 3)	Question number 1 is compulsor In Answer Book. Figure on right indicates full mark Assume suitable data wherever r	y. It s ks. neede	hould be solved in first 30 minuted in first 30 minuted and the solved in first 30 minuted and the solution it clearly.	tes
_			MCQ/Objective Typ	e Que	estions	
Dura	tion: 3	0 Min	utes		Mark	s: 14
Q.1	Choo	se th	e correct alternatives from the	optio	ns and rewrite the sentence.	14
	1)	Mecr a) c)	nanical grinders are used for Reducing size Anaerobic process	b) d)	Reducing volume None of these	
	2)	Mech	nanical size reduction operation ir	nclude	es	
		a) c)	Shredding Milling	b) d)	Grinding All of these	
	3)	Sani	tary landfills may cause troubles o	during	·	
		a) c)	peak summers peak monsoons	b) d)	peak winters None	
	4)	The	biomedical waste management ad	ct wer	e enacted in	
		a) c)	1976 1998	b) d)	1988 1980	
	5)	A go	od way of dealing with the solid w	aste	problem is	
		a)	Landfilling	b)	Recycling	
		C)	Both (a) & (b)	d)	None of these	
	6)		_ process improves efficiency of	solid v	waste management	
		a)	Disposal	b)	Collection	
		C)	Processing	a)	Composing	
	()	<u></u>	_ composting requires large area Manual composting	b)	Mechanical composting	
		a) C)	Open window composting	d)	Trenching	
	8) is a liquid that passes through solid waste and extract suspende					
	•)	impu	rities from it.			
		a)	Distilled water	b)	Municipal waste	
		c)	Leachate	d)	Sludge	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil** Engineering

SOLID AND HAZARDOUS & WASTE MANAGEMENT

- SLR-FM-96
 - Set Ρ

- is a biological method of disposal of municipal solid waste. 9)
 - Shredding Landfills b) a) C) Pulverization d) composting
- 10) Substances that emit ionizing radiation are defined as ____
 - Hazardous waste a) c) Flammable wastes
- b) Radioactive wastes d) **Biological wastes**

- 0

Seat No.

11) Hazardous biomedical wastes are generated in _____.

- Hospitals a)
- **Biological research facilities** b)
- Industrial biological conversion process C)
- All of above d)

12) Separation, processing of solid waste are used to reduce _

- Volume of S.W b) a) Both a) and b) C)
- Weight of S.W None of these d)

SLR-FM-96

Set P

- The final functional element in solid waste management system is _____. 13)
 - Transfer & transportation a)
- Collection b)
- Processing & recovery c)
- d) Disposal
- The pyrolysis process of SWM is ____ 14)
 - Endothermic a)
- b) Exothermic

_.

- Heterothermic c)
- d) None of these

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 is compulsory. Solve any two from Q. No. 3, 4 & 5.

- 2) Q.No.6 is compulsory. Solve any two from Q. No. 7, 8 & 9.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever needed & mention it clearly.

Section I

Q.2 Solve any two.

- a) Write advantages and disadvantages of Incineration treatment.
- b) Distinguish between Indore method and Bangalore method of composting.
- c) Write the use of different industrial waste.

Q.3 Solve All.

Seat

No.

- a) Describe the effect of following on composting process
 - 1) C/N ratio
 - 2) Temperature
 - 3) Moisture content
 - 4) pH
 - 5) Particle size
- **b)** Explain the functional elements of municipal solid waste management with flow diagram.

Q.4 Solve All.

- a) Write a note on recovery of Bio-gas energy from organic solid waste.
- b) State and explain briefly the various methods of handling and processing of solid waste.
- Q.5 b) Estimate the Moisture Content of solid waste sample of 100kg using the 10 following data.

Sr. No	Component	% by mass	% by MC (Moisture Content)
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastics	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

SLR-FM-96



Max. Marks: 56

80

10

10

SLR-FM-96 Set P

Section-II

Q.6	Solv a)	Te any two. Explain the different techniques used to control contamination of ground water.	08
	b) c)	Explain in detail any one case study of hazards. Write site selection criteria for sanitary landfilling.	
Q.7	Solv a) b)	ve All. Define Hazardous waste. Explain in brief characteristics of Hazardous waste. waste. Write a note on waste minimization and resource recovery.	10
Q.8	Solv a) b)	W rite a note on 'Risk assessment and management'. Explain natural and manmade hazards with examples.	10
Q.9	Writ a) b)	e Short Notes. Storage and transportation of hazardous waste Factors affecting the composting process.	10

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019

Civil Engineering

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Question number 1 is compulsory. It should be solved in first 30 minutes In Answer Book.

- 2) Figure on right indicates full marks.
- 3) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

a)

2)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

- _____ is a liquid that passes through solid waste and extract suspended impurities from it.
 - a) Distilled waterc) Leachate

b) Municipal wasted) Sludge

Weight of S.W

- _____ is a biological method of disposal of municipal solid waste.
 - Shredding b) Landfills
 - c) Pulverization d) composting

3) Substances that emit ionizing radiation are defined as _____

- Hazardous waste b) Radioactive wastes
- c) Flammable wastes d) Biological wastes
- 4) Hazardous biomedical wastes are generated in _____.
 - a) Hospitals
 - b) Biological research facilities
 - c) Industrial biological conversion process
 - d) All of above

5) Separation, processing of solid waste are used to reduce _____

- a) Volume of S.W
- c) Both a) and b) d) None of these

6) The final functional element in solid waste management system is _____.

b)

- a) Transfer & transportation b) Collection
- c) Processing & recovery d) Disposal
- 7) The pyrolysis process of SWM is _____.
 - a) Endothermic b) Exothermic
 - c) Heterothermic d) None of these
- 8) Mechanical grinders are used for _____.a) Reducing size b) Reducing volume
 - c) Anaerobic process d) None of these

9) Mechanical size reduction operation includes _____

a) Shreddingb) Grindingc) Millingd) All of these

SLR-FM-96



Max. Marks: 70

Marks: 14

n it clearly.

			SLR-FM-96
			Set Q
10)	Sanitary landfills may cause trouble	es durin	g
	a) peak summers	b)	peak winters
	c) peak monsoons	d)	None
11)	The biomedical waste managemen	t act we	ere enacted in
	a) 1976	b)	1988
	c) 1998	d)	1980
12)	A good way of dealing with the solid	d waste	problem is
	a) Landfilling	b)	Recycling
	c) Both (a) & (b)	d)	None of these
13)	 process improves efficiency a) Disposal c) Processing 	of solid b) d)	waste management Collection Composting

- __ composting requires large area. Manual composting b Open window composting c 14)
 - <u>a)</u>
 - c)
- Mechanical composting Trenching b)
- d)

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Civil Engineering

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 is compulsory. Solve any two from Q. No. 3, 4 & 5.

- 2) Q.No.6 is compulsory. Solve any two from Q. No. 7, 8 & 9.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever needed & mention it clearly.

Section I

Q.2 Solve any two.

- a) Write advantages and disadvantages of Incineration treatment.
- b) Distinguish between Indore method and Bangalore method of composting.
- c) Write the use of different industrial waste.

Q.3 Solve All.

Seat

No.

- a) Describe the effect of following on composting process
 - 1) C/N ratio
 - 2) Temperature
 - 3) Moisture content
 - 4) pH
 - 5) Particle size
- **b)** Explain the functional elements of municipal solid waste management with flow diagram.

Q.4 Solve All.

- a) Write a note on recovery of Bio-gas energy from organic solid waste.
- **b)** State and explain briefly the various methods of handling and processing of solid waste.
- Q.5 b) Estimate the Moisture Content of solid waste sample of 100kg using the 10 following data.

Sr. No	Component	% by mass	% by MC (Moisture Content)
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastics	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

SLR-FM-96



Max. Marks: 56

08

10

10

SLR-FM-96 Set Q

Section-II

Q.6	Solv a)	e any two. Explain the different techniques used to control contamination of ground water.	80						
	b) c)	Explain in detail any one case study of hazards. Write site selection criteria for sanitary landfilling.							
Q.7	Solv a) b)	ve All. Define Hazardous waste. Explain in brief characteristics of Hazardous waste. Write a note on waste minimization and resource recovery	10						
Q.8	Solv a) b)	Write a note on 'Risk assessment and management'. Explain natural and manmade hazards with examples.	10						
Q.9	Writ a) b)	e Short Notes. Storage and transportation of hazardous waste Factors affecting the composting process.	10						
Time	e: 02:3	30 PN	1 To 05:30 PM						
------	----------	--	--	--	--------------------------------	-----------	----	--	--
Inst	ructio	o ns: 1 2 3) Question number 1 is comp In Answer Book. 2) Figure on right indicates fu 3) Assume suitable data when 	oulsory. It s Il marks. ever neede	hould be solved in first 30) minutes			
_			MCQ/Objective	e Type Qu	estions				
Dura	ation: 3	30 Mi	nutes			Marks:	14		
Q.1		ose t	ne correct alternatives from	n the optic	ons and rewrite the sent	ence.	14		
	1)	a) c)	Landfilling Both (a) & (b)	b) d)	Recycling None of these				
	2)		process improves efficien	cv of solid	waste management				
	,	a)	Disposal)	Collection				
		c)	Processing	d)	Composting				
	3)		composting requires large	e area.					
		a)	Manual composting	b)	Mechanical composting				
		C)	Open window composting	d)	Irenching				
	4)	is a liquid that passes through solid waste and extract suspen							
		imp	Urities from it.	b)	Municipal wasta				
		a) C)	Leachate	d)	Sludge				
	5)	,	is a biological method of	hisposal of	municinal solid waste				
	0)	<u>a)</u>	Shredding	b)	Landfills				
		c)	Pulverization	d)	composting				
	6)	Sub	stances that emit ionizing rad	diation are	defined as				
	,	a)	Hazardous waste	b)	Radioactive wastes				
		c)	Flammable wastes	d)	Biological wastes				
	7)	Haz a) b) c) d)	ardous biomedical wastes an Hospitals Biological research facilities Industrial biological convers All of above	re generate s sion proces	ed in SS				
	8)	Sep a)	paration, processing of solid v Volume of S.W	vaste are u b)	sed to reduce Weight of S.W				

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Tin

SLR-FM-96

Max. Marks: 70

Set R

- Both a) and b) c)
 - None of these d)
- The final functional element in solid waste management system is _____. 9)
 - Collection Transfer & transportation a) b)
 - Processing & recovery c) d) Disposal

Seat No.



The pyrolysis process of SWM is _____. 10) Endothermic Exothermic a) b) Heterothermic None of these C) d) 11) Mechanical grinders are used for ____ Reducing size b) Reducing volume a) C) Anaerobic process d) None of these Mechanical size reduction operation includes ____ 12) . Grinding a) Shredding b) Milling d) All of these C) 13) Sanitary landfills may cause troubles during _ peak winters peak summers a) b) peak monsoons None d) C) The biomedical waste management act were enacted in _____. 14) 1976 1988 b) a) C) 1998 d) 1980

SLR-FM-96

Set | R

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 is compulsory. Solve any two from Q. No. 3, 4 & 5.

- 2) Q.No.6 is compulsory. Solve any two from Q. No. 7, 8 & 9.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever needed & mention it clearly.

Section I

Q.2 Solve any two.

- a) Write advantages and disadvantages of Incineration treatment.
- b) Distinguish between Indore method and Bangalore method of composting.
- c) Write the use of different industrial waste.

Q.3 Solve All.

Seat

No.

- a) Describe the effect of following on composting process
 - 1) C/N ratio
 - 2) Temperature
 - 3) Moisture content
 - 4) pH
 - 5) Particle size
- **b)** Explain the functional elements of municipal solid waste management with flow diagram.

Q.4 Solve All.

- a) Write a note on recovery of Bio-gas energy from organic solid waste.
- b) State and explain briefly the various methods of handling and processing of solid waste.
- Q.5 b) Estimate the Moisture Content of solid waste sample of 100kg using the 10 following data.

Sr. No	Component	% by mass	% by MC (Moisture Content)
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastics	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

SLR-FM-96



Max. Marks: 56

80

10

SLR-FM-96 Set R

Section-II

Q.6	 Solve any two. a) Explain the different techniques used to control contamination of ground water. 			
	b) c)	Explain in detail any one case study of hazards. Write site selection criteria for sanitary landfilling.		
Q.7	Solv a) b)	e All. Define Hazardous waste. Explain in brief characteristics of Hazardous waste. Write a note on waste minimization and resource recovery	10	
Q.8	Solv a) b)	e All. Write a note on 'Risk assessment and management'. Explain natural and manmade hazards with examples.	10	
Q.9	Write a) b)	e Short Notes. Storage and transportation of hazardous waste Factors affecting the composting process.	10	

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019

Civil Engineering

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Instructions: 1) Question number 1 is compulsory. It should be solved in first 30 minutes In Answer Book.

- 2) Figure on right indicates full marks.
- 3) Assume suitable data wherever needed & mention it clearly. **MCQ/Objective Type Questions**

Q.1	Choo	hoose the correct alternatives from the options and rewrite the sentence.								
	1)	Subs a) c)	tances that emit ionizing radiation Hazardous waste Flammable wastes	n are b) d)	Radioactive wastes Biological wastes					
	2)	Haza a) b) c) d)	rdous biomedical wastes are ger Hospitals Biological research facilities Industrial biological conversion p All of above	nerate proces	ed in SS					
	3)	Sepa a) c)	ration, processing of solid waste Volume of S.W Both a) and b)	are u b) d)	ised to reduce Weight of S.W None of these					
	4)	The f a) c)	inal functional element in solid wa Transfer & transportation Processing & recovery	aste r b) d)	management system is Collection Disposal					
	5)	The p a) c)	byrolysis process of SWM is Endothermic Heterothermic	 b) d)	Exothermic None of these					
	6)	Mech a) c)	anical grinders are used for Reducing size Anaerobic process	 b) d)	Reducing volume None of these					
	7)	Mech a) c)	anical size reduction operation ir Shredding Milling	nclude b) d)	es Grinding All of these					
	8)	Sanit a) c)	ary landfills may cause troubles of peak summers peak monsoons	during b) d)) peak winters None					
	9)	The b a) c)	biomedical waste management a 1976 1998	ct we b) d)	re enacted in 1988 1980					
	10)	A goo a) c)	od way of dealing with the solid w Landfilling Both (a) & (b)	/aste b) d)	problem is Recycling None of these					

Max. Marks: 70

Marks: 14

14

CI	D		ЛО	6
J	_K·	• F N	/1-9	O

Set

S

Seat No.

- 11) process improves efficiency of solid waste management _____.
 - Disposal a) C)

Collection b)

Processing

- d) Composting
- composting requires large area. 12)
 - Manual composting a) C) Open window composting
- Mechanical composting b) Trenching d)

SLR-FM-96

Set S

- 13) is a liquid that passes through solid waste and extract suspended impurities from it.
 - Distilled water a) C)

Municipal waste b)

Leachate

- d) Sludge
- 14) is a biological method of disposal of municipal solid waste.
 - Shredding a) C)

- b) Landfills
- Pulverization
- d) composting

SOLID AND HAZARDOUS & WASTE MANAGEMENT

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.2 is compulsory. Solve any two from Q. No. 3, 4 & 5.

- 2) Q.No.6 is compulsory. Solve any two from Q. No. 7, 8 & 9.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever needed & mention it clearly.

Section I

Q.2 Solve any two.

- a) Write advantages and disadvantages of Incineration treatment.
- b) Distinguish between Indore method and Bangalore method of composting.
- c) Write the use of different industrial waste.

Q.3 Solve All.

Seat

No.

- a) Describe the effect of following on composting process
 - 1) C/N ratio
 - 2) Temperature
 - 3) Moisture content
 - 4) pH
 - 5) Particle size
- **b)** Explain the functional elements of municipal solid waste management with flow diagram.

Q.4 Solve All.

- a) Write a note on recovery of Bio-gas energy from organic solid waste.
- b) State and explain briefly the various methods of handling and processing of solid waste.
- Q.5 b) Estimate the Moisture Content of solid waste sample of 100kg using the 10 following data.

Sr. No	Component	% by mass	% by MC (Moisture Content)
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastics	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

SLR-FM-96



Max. Marks: 56

80

10

SLR-FM-96 Set S

Section-II

Q.6	 Solve any two. a) Explain the different techniques used to control contamination of ground water. 			
	b) c)	Explain in detail any one case study of hazards. Write site selection criteria for sanitary landfilling.		
Q.7	Solv a)	e All. Define Hazardous waste. Explain in brief characteristics of Hazardous waste.	10	
Q.8	Solv a) b)	e All. Write a note on 'Risk assessment and management'. Explain natural and manmade hazards with examples.	10	
Q.9	Write a) b)	e Short Notes. Storage and transportation of hazardous waste Factors affecting the composting process.	10	

Page **1** of **16**

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF BRIDGES**

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- Figures to the right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 The minimum width of carriage way for a two lane bridge is _____. 1) 4.25m a) b) 10m C) 6m d) 7.5m Culvert is the type of bridge whose span is _____ 2) Between 6m-60m Above 60m a) b) c) Less than 6m d) None of these In designing deck slab maximum bending moment develops when the IRC 3) class AA tracked vehicle is placed _ Adjacent to support b) At the center of span a) C) At quarter span Anywhere on span d) As per crack control criteria of IRC-21, the spacing of main reinforced bar 4) shall not exceed . 100mm a) b) 300mm 200mm d) 150mm c) Simply supported span requires _____. 5) Fixed bearing at both ends a) Expansion bearing at both ends b) c) Fixed bearing at one end and expansion bearing at the other Either a or b, both are correct d) 6) The toe and heel of the base slab are so proportioned that is eccentricity of resultant is limited to 1/3 of the base width b) 1/6 of the base width a) 2/3 of the base width c) d) 1/2 of the base width The wearing coat specified in the Indian standard codes on reinforced 7) concrete deck slab is in the range of a) 25 to 40mm b) 40 to 60 mm 75 to 100 mm d) none of these c) According to Courbon's method of analysis, the ratio of depth of cross beam 8) to main girder in a Tee beam slab bridge deck should be at least _____. 0.5 0.75 a) b) C) 1.2 1 d)

Seat No.

SLR-FM-98

Max. Marks: 70

Set

Marks: 14

Set The minimum number of cross beams in a T bridge should be _____. a) 3 b) 5 c) 6 d) None of these The shape factor of an elastomeric pad bearing designed to support a bridge girder should have value in the range of 4 to 8 b) 6 to 12 a) 12 to 16 16 to 20 C) d) Span is called as economical span when ____ Cost of substructure should be equal to cost of superstructure. a) Cost of substructure should be greater than Cost of superstructure. b) Cost of substructure should be less than Cost of superstructure. c) Does not depend on cost. d) Section III or IRC bridge codes is related with _____. Loads and stress a)

- - c) Cement concrete (plain and reinforced)
 - Steel road bridges d)

13) Pigeaud's curves are used to calculate

- Bending moment coefficients b) a)
- Impact factor Effective span C) d)
- As per crack control criteria of IRC-21, the diameter of bar in slabs shall 14) not exceed .
 - a) 36mm b) 32mm
 - 25mm c)

d) 40mm

Load factor

- SLR-FM-98
- 9)

12)

10)

11)

- Foundation and substructure b)

DESIGN OF BRIDGES

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions:	1)	Solve any	/ three of	auestions	each from	Section I	and	Section	II.
motiono.				questions	cuon nom	00000011	ana	000000	

- 2) Q No. 4 & Q No.6 is compulsory.
- 3) Assume suitable data if necessary and mention it clearly.

Section I

Answer the following Q.2

- Enlist the various loads to be considered for the analysis of bridges? 05 a) Explain any one in detail. 04
- Discuss the IRC class B loading. b)
- Q.3 Design a solid deck slab for Two lane bridge for following data.
 - Effective span 6 m a)
 - Carriage way width 7.5 m b)
 - Kerb 600 x 275 on both side C)
 - d) Live load - IRC Class A (two lane)
 - e) Wearing coat - 110 mm thick
 - Use M-25 concrete and Fe-415 steel **f**)
 - Use $\alpha = 2.72$ g)
- Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 10 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. Use following additional data,
 - Carriage way width 7.5 m a)
 - Span of bridge 16m b)
 - c) Live Load - IRC class AA Tracked
 - Kerb 600 mm wide, 400 mm deep d)
 - Web thickness for Longitudinal and cross girder 300 mm e)
 - f) Longitudinal Girder spacing - 275 mm
 - Use M-25 concrete and Fe-415 steel g)
- Q.5 Write the step wise procedure of design of Slab Panel using Pigeaud's theory. 09 Also discuss the limitation of the same.

Section – II

Q.6 Verify the adequacy of pier for the following data: 10 Top width of pier - 1.8 m, Height of pier up to springing level - 10 m, C/C distance of bearing - 1.1 m, Side batter 1:14, HFL - 1.4 m below the bearing level, Span of bridge - 16 m, Self-weight of the superstructure = 200 kN/m, Live load - IRC class AA tracked, Material of pier = M20 concrete

SLR-FM-98

Max. Marks: 56



Q.7 Verify the suitability of abutment as shown in the fig 7.1. Use following data Density of soil - 17 kN/m³, Friction angle of soil (\emptyset) = 31°. Coefficient of friction - 0.5, Live load IRC class AA tracked.





Q.8	a)	Design a elastomeric unreinforced bearing pad for following data Vertical load (sustained) = 170 kN, Vertical load (dynamic) = 50 kN, Horizontal force = 90 kN Modulus of rigidity of elastomer - 1.1 N/mm ² coefficient of friction = 0.4	05
	b)	Write a note on inspection of bridges	04
Q.9	Wr	ite a note on following. (Any Three)	09

- a) Caisson foundation for bridges
- **b)** Maintenance of bridge
- c) Expansion joints
- d) Instruments required for bridge inspection

SLR-FM-98

Set

Ρ

Page 5 of 16

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF BRIDGES**

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- Figures to the right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions Duration: 30 Minutes Marks: 14 Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 According to Courbon's method of analysis, the ratio of depth of cross beam 1) to main girder in a Tee beam slab bridge deck should be at least _____. b) 0.75 a) 0.5 C) 1 d) 1.2 2) The minimum number of cross beams in a T bridge should be _____. a) b) 3 5 6 C) d) None of these 3) The shape factor of an elastomeric pad bearing designed to support a bridge girder should have value in the range of 4 to 8 6 to 12 a) b) c) 12 to 16 d) 16 to 20 4) Span is called as economical span when _____. Cost of substructure should be equal to cost of superstructure. a) Cost of substructure should be greater than Cost of superstructure. b) Cost of substructure should be less than Cost of superstructure. c) Does not depend on cost. d) Section III or IRC bridge codes is related with _____. 5) a) Loads and stress b) Foundation and substructure Cement concrete (plain and reinforced) c) Steel road bridges d) Pigeaud's curves are used to calculate 6) Bending moment coefficients b) Load factor a) Impact factor c) d) Effective span 7) As per crack control criteria of IRC-21, the diameter of bar in slabs shall not exceed 36mm 32mm a) b) c) 25mm d) 40mm 8) The minimum width of carriage way for a two lane bridge is . 4.25m 10m a) b) 7.5m C) 6m d) 9) Culvert is the type of bridge whose span is _____ Between 6m-60m Above 60m a) b) C) Less than 6m d) None of these

Seat No.

SLR-FM-98

Set

Max. Marks: 70

10) In designing deck slab maximum bending moment develops when the IRC class AA tracked vehicle is placed

Adjacent to support a) At quarter span

C)

b) At the center of span

d) Anywhere on span

SLR-FM-98

Set

- As per crack control criteria of IRC-21, the spacing of main reinforced bar 11) shall not exceed _____.
 - 100mm b) 300mm a)
 - C) 200mm d) 150mm
- Simply supported span requires _____. 12)
 - Fixed bearing at both ends a)
 - Expansion bearing at both ends b)
 - Fixed bearing at one end and expansion bearing at the other c)
 - Either a or b, both are correct d)
- The toe and heel of the base slab are so proportioned that is eccentricity 13) of resultant is limited to
 - a) 1/3 of the base width
- b) 1/6 of the base width
- C) 2/3 of the base width
- d) 1/2 of the base width
- 14) The wearing coat specified in the Indian standard codes on reinforced concrete deck slab is in the range of
 - 25 to 40mm a)
 - 75 to 100 mm C)
- 40 to 60 mm b)
- d) none of these

DESIGN OF BRIDGES

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions:	1)	Solve any	/ three o	auestions	each from	Section	and	Section	II.
			,	9400110110	0001110111	0000001	ana	000000	

- 2) Q No. 4 & Q No.6 is compulsory.
- 3) Assume suitable data if necessary and mention it clearly.

Section I

Answer the following Q.2

- Enlist the various loads to be considered for the analysis of bridges? 05 a) Explain any one in detail. 04
- Discuss the IRC class B loading. b)
- Q.3 Design a solid deck slab for Two lane bridge for following data.
 - Effective span 6 m a)
 - Carriage way width 7.5 m b)
 - Kerb 600 x 275 on both side C)
 - d) Live load - IRC Class A (two lane)
 - e) Wearing coat - 110 mm thick
 - Use M-25 concrete and Fe-415 steel **f**)
 - Use $\alpha = 2.72$ g)
- Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 10 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. Use following additional data,
 - Carriage way width 7.5 m a)
 - Span of bridge 16m b)
 - c) Live Load - IRC class AA Tracked
 - Kerb 600 mm wide, 400 mm deep d)
 - Web thickness for Longitudinal and cross girder 300 mm e)
 - f) Longitudinal Girder spacing - 275 mm
 - Use M-25 concrete and Fe-415 steel g)
- Q.5 Write the step wise procedure of design of Slab Panel using Pigeaud's theory. 09 Also discuss the limitation of the same.

Section – II

Q.6 Verify the adequacy of pier for the following data: Top width of pier - 1.8 m, Height of pier up to springing level - 10 m, C/C distance of bearing - 1.1 m, Side batter 1:14, HFL - 1.4 m below the bearing level, Span of bridge - 16 m, Self-weight of the superstructure = 200 kN/m, Live load - IRC class AA tracked, Material of pier = M20 concrete

SLR-FM-98

Max. Marks: 56



10

Q.7 Verify the suitability of abutment as shown in the fig 7.1. Use following data Density of soil - 17 kN/m³, Friction angle of soil (\emptyset) = 31°. Coefficient of friction - 0.5, Live load IRC class AA tracked.



Fig no 7.1

Q.8	a) b)	Design a elastomeric unreinforced bearing pad for following data Vertical load (sustained) = 170 kN, Vertical load (dynamic) = 50 kN, Horizontal force = 90 kN Modulus of rigidity of elastomer - 1.1 N/mm ² coefficient of friction = 0.4 Write a note on inspection of bridges	05
Q.9	Wr	ite a note on following. (Any Three)	09

- a) Caisson foundation for bridges
- **b)** Maintenance of bridge
- **c)** Expansion joints
- d) Instruments required for bridge inspection

SLR-FM-98

Set

Q

Page 9 of 16

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF BRIDGES**

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

1)

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

Figures to the right indicate full marks.

Simply supported span requires ____

3) Assume suitable data if necessary and mention it clearly.

Q.1 Choose the correct alternatives from the options and rewrite the sentence.

MCQ/Objective Type Questions

- Fixed bearing at both ends a) Expansion bearing at both ends b) Fixed bearing at one end and expansion bearing at the other c) Either a or b. both are correct d) The toe and heel of the base slab are so proportioned that is eccentricity of resultant is limited to 1/3 of the base width a) b) 1/6 of the base width c) 2/3 of the base width d) 1/2 of the base width The wearing coat specified in the Indian standard codes on reinforced concrete deck slab is in the range of 25 to 40mm b) 40 to 60 mm a) d) c) 75 to 100 mm none of these to main girder in a Tee beam slab bridge deck should be at least a) 0.5 b) 0.75 d) 1.2 c) 1 The minimum number of cross beams in a T bridge should be _____. a) 3 b) 5 6 d) None of these c) The shape factor of an elastomeric pad bearing designed to support a bridge girder should have value in the range of _ 4 to 8 6 to 12 a) b) 16 to 20 C) 12 to 16 d) Span is called as economical span when _____ Cost of substructure should be equal to cost of superstructure. a) Cost of substructure should be greater than Cost of superstructure. b) Cost of substructure should be less than Cost of superstructure. c) d) Does not depend on cost. Section III or IRC bridge codes is related with _____. Loads and stress a) Foundation and substructure b)
 - Cement concrete (plain and reinforced) c)
 - Steel road bridges d)

Seat No.

SLR-FM-98

Set

Max. Marks: 70

Marks: 14

14

- 2)
- 3)
- 4) According to Courbon's method of analysis, the ratio of depth of cross beam
- 5)

6)

- 7)
- 8)

Set R 9) Pigeaud's curves are used to calculate Bending moment coefficients Load factor a) b) c) Impact factor d) Effective span As per crack control criteria of IRC-21, the diameter of bar in slabs shall 10) not exceed _____. 32mm a) 36mm b) 40mm c) 25mm d) The minimum width of carriage way for a two lane bridge is _____. 11) 4.25m 10m a) b) 7.5m C) 6m d) Culvert is the type of bridge whose span is _ 12) Between 6m-60m Above 60m a) b) d) Less than 6m None of these c) In designing deck slab maximum bending moment develops when the IRC 13) class AA tracked vehicle is placed a) Adjacent to support b) At the center of span C) At quarter span d) Anywhere on span 14) As per crack control criteria of IRC-21, the spacing of main reinforced bar shall not exceed . 100mm 300mm b) a)

c) 200mm d) 150mm

SLR-FM-98

SLR-FM-98 Set

Seat No.

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF BRIDGES**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Instructions:	1)	Solve any	/ three o	questions	each from	Section	and	Section	П.
monucions.				10030013	caon nom	Occuon	ana	OCCUON	

- 2) Q No. 4 & Q No.6 is compulsory.
- 3) Assume suitable data if necessary and mention it clearly.

Section I

Answer the following Q.2

- Enlist the various loads to be considered for the analysis of bridges? 05 a) Explain any one in detail. 04
- Discuss the IRC class B loading. b)
- Q.3 Design a solid deck slab for Two lane bridge for following data.
 - Effective span 6 m a)
 - b) Carriage way width - 7.5 m
 - Kerb 600 x 275 on both side C)
 - d) Live load - IRC Class A (two lane)
 - e) Wearing coat - 110 mm thick
 - Use M-25 concrete and Fe-415 steel **f**)
 - Use $\alpha = 2.72$ g)
- Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 10 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. Use following additional data,
 - Carriage way width 7.5 m a)
 - Span of bridge 16m b)
 - c) Live Load - IRC class AA Tracked
 - Kerb 600 mm wide, 400 mm deep d)
 - Web thickness for Longitudinal and cross girder 300 mm e)
 - f) Longitudinal Girder spacing - 275 mm
 - Use M-25 concrete and Fe-415 steel g)
- Q.5 Write the step wise procedure of design of Slab Panel using Pigeaud's theory. 09 Also discuss the limitation of the same.

Section – II

Q.6 Verify the adequacy of pier for the following data: 10 Top width of pier - 1.8 m, Height of pier up to springing level - 10 m, C/C distance of bearing - 1.1 m, Side batter 1:14, HFL - 1.4 m below the bearing level, Span of bridge - 16 m, Self-weight of the superstructure = 200 kN/m, Live load - IRC class AA tracked, Material of pier = M20 concrete

Max. Marks: 56

Q.7 Verify the suitability of abutment as shown in the fig 7.1. Use following data Density of soil - 17 kN/m³, Friction angle of soil (\emptyset) = 31°. Coefficient of friction - 0.5, Live load IRC class AA tracked.



Fig no 7.1

Q.8	a) b)	Design a elastomeric unreinforced bearing pad for following data Vertical load (sustained) = 170 kN, Vertical load (dynamic) = 50 kN, Horizontal force = 90 kN Modulus of rigidity of elastomer - 1.1 N/mm ² coefficient of friction = 0.4 Write a note on inspection of bridges	05
Q.9	Wri	te a note on following. (Any Three)	09

- a) Caisson foundation for bridges
- **b)** Maintenance of bridge
- c) Expansion joints
- d) Instruments required for bridge inspection

SLR-FM-98

Set

R

SLR-FM-98

Set

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF BRIDGES**

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Seat

No.

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

The shape factor of an elastomeric pad bearing designed to support a 1)

bridg	e girder s	hould h	nave val	ue in the	e range	e of	
a) Č	4 to 8				b)	6 to 12	
c)	12 to 16				d	16 to 20	

c) 12 to 16 d) 16 to				
	c)	12 to 16	d)	16 to 2

- Span is called as economical span when _ 2)
 - Cost of substructure should be equal to cost of superstructure. a)
 - Cost of substructure should be greater than Cost of superstructure. b)
 - Cost of substructure should be less than Cost of superstructure. c)
 - d) Does not depend on cost.

Section III or IRC bridge codes is related with _____. 3)

- Loads and stress a)
- b) Foundation and substructure
- Cement concrete (plain and reinforced) c)
- Steel road bridges d)
- Pigeaud's curves are used to calculate 4)
 - Bending moment coefficients Load factor a) b)
 - c) Impact factor d) Effective span
- 5) As per crack control criteria of IRC-21, the diameter of bar in slabs shall not exceed .
 - 36mm a) b) 32mm 40mm
- c) 25mm d)
- 6) The minimum width of carriage way for a two lane bridge is _____.
 - 4.25m 10m a) b)
 - 7.5m C) 6m d)

7) Culvert is the type of bridge whose span is _

- Between 6m-60m b) Above 60m a)
 - c) Less than 6m d) None of these
- In designing deck slab maximum bending moment develops when the IRC 8) class AA tracked vehicle is placed
 - Adjacent to support At the center of span a) b)
 - At quarter span Anywhere on span c) d)
- 9) As per crack control criteria of IRC-21, the spacing of main reinforced bar shall not exceed _____. b) 300mm
 - 100mm a)
 - 200mm 150mm c) d)

Marks: 14

Max. Marks: 70

SLR-FM-98 Set S

- 10) Simply supported span requires _____.
 - Fixed bearing at both ends a)
 - Expansion bearing at both ends b)
 - Fixed bearing at one end and expansion bearing at the other C)
 - Either a or b, both are correct d)
- 11) The toe and heel of the base slab are so proportioned that is eccentricity of resultant is limited to ____.
 - b) 1/3 of the base width 1/6 of the base width a)
 - 2/3 of the base width C) d) 1/2 of the base width
- The wearing coat specified in the Indian standard codes on reinforced 12) concrete deck slab is in the range of _
 - a) 25 to 40mm

C)

- b) 40 to 60 mm
- 75 to 100 mm c) d) none of these
- According to Courbon's method of analysis, the ratio of depth of cross beam 13) to main girder in a Tee beam slab bridge deck should be at least _____.
 - b) 0.75 a) 0.5
 - C) d) 1.2 1
- The minimum number of cross beams in a T bridge should be _____. 14)
 - a) 3 6
- b) 5 d) None of these

Page 14 of 16

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Civil Engineering DESIGN OF BRIDGES**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Instructions:	1)	Solve any	/ three o	nuestions	each from	Section	l and	Section	П
manuchona.	- 1			100310113	caciniton	Occuon	anu	Occuon	

- 2) Q No. 4 & Q No.6 is compulsory.
- 3) Assume suitable data if necessary and mention it clearly.

Section I

Answer the following Q.2

- Enlist the various loads to be considered for the analysis of bridges? 05 a) Explain any one in detail. 04
- Discuss the IRC class B loading. b)
- Q.3 Design a solid deck slab for Two lane bridge for following data.
 - Effective span 6 m a)
 - Carriage way width 7.5 m b)
 - Kerb 600 x 275 on both side C)
 - d) Live load - IRC Class A (two lane)
 - e) Wearing coat - 110 mm thick
 - Use M-25 concrete and Fe-415 steel **f**)
 - Use $\alpha = 2.72$ g)
- Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 10 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. Use following additional data,
 - Carriage way width 7.5 m a)
 - Span of bridge 16m b)
 - c) Live Load - IRC class AA Tracked
 - Kerb 600 mm wide, 400 mm deep d)
 - Web thickness for Longitudinal and cross girder 300 mm e)
 - f) Longitudinal Girder spacing - 275 mm
 - Use M-25 concrete and Fe-415 steel g)
- Q.5 Write the step wise procedure of design of Slab Panel using Pigeaud's theory. 09 Also discuss the limitation of the same.

Section – II

Q.6 Verify the adequacy of pier for the following data: 10 Top width of pier - 1.8 m, Height of pier up to springing level - 10 m, C/C distance of bearing - 1.1 m, Side batter 1:14, HFL - 1.4 m below the bearing level, Span of bridge - 16 m, Self-weight of the superstructure = 200 kN/m, Live load - IRC class AA tracked, Material of pier = M20 concrete

Max. Marks: 56

09

SLR-FM-98

Set

Seat No.

Q.7 Verify the suitability of abutment as shown in the fig 7.1. Use following data Density of soil - 17 kN/m³, Friction angle of soil (\emptyset) = 31°. Coefficient of friction - 0.5, Live load IRC class AA tracked.





Q.8	a) b)	Design a elastomeric unreinforced bearing pad for following data Vertical load (sustained) = 170 kN, Vertical load (dynamic) = 50 kN, Horizontal force = 90 kN Modulus of rigidity of elastomer - 1.1 N/mm ² coefficient of friction = 0.4 Write a note on inspection of bridges	05 04
Q.9	Wri	te a note on following. (Any Three)	09

- a) Caisson foundation for bridges
- **b)** Maintenance of bridge
- c) Expansion joints
- d) Instruments required for bridge inspection

SLR-FM-98

Set

S