Seat	
No.	

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III

Day & Date: Saturday, 07-12-2019

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) Use of non programmable scientific calculator allowed.
  - 3) Figures to the right indicate full marks.
  - 4) 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

- 1) The general solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_.
  - a)  $\tilde{y} = (c_1 + c_2 x) e^x + (c_3 + c_4 x) e^{-x}$
  - b)  $y = (c_1 + c_2 x) \cos \sqrt{3} x + (c_3 + c_4 x) \sin \sqrt{3} x$
  - c)  $y = (c_1 + c_2 x) e^{-x} + (c_3 + c_4 x) e^{x}$
  - d)  $y = (c_1 + c_2 \cos x)e^x + (c_3 + c_4 \sin x)e^x$
- 2) The particular integral of  $(D^4 n^4)y = \sin nx$  is
  - a)  $\frac{x}{4n^3}\sin nx$ b)  $-\frac{x}{4n^3}\cos nx$ c)  $\frac{x}{4n^3}\cos nx$ d)  $-\frac{x}{4n^3}\sin nx$
- 3) If f(t) = f(t + T) where T is period of f(t) then  $L\{f(t)\} =$ \_\_\_\_\_.
  - a)  $\frac{1}{1 e^{-Ts}} \int_{0}^{T} e^{-st} f(t) dt$ b)  $\frac{1}{1 - e^{Ts}} \int_{0}^{T} e^{-st} f(t) dt$ c)  $\frac{1}{1 - e^{st}} \int_{0}^{T} e^{-ST} f(t) dt$ d)  $\frac{1}{1 - e^{-st}} \int_{0}^{T} e^{ST} f(t) dt$

4) 
$$L^{-1}\left\{\frac{s+3}{s^2+3^2}\right\} =$$
\_\_\_\_\_.  
a)  $\cos 3t$  b)  $\sin 3t$   
c)  $3t + \cos 3t$  d)  $\cos 3t + \sin 3t$ 

Max. Marks: 70

Marks: 14

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5)	If $L\{f_1(t)\} = \phi_1(s) \& L\{f_2(t)\} = \phi_2(t)$	(s) then $L^{-1}\{\phi_1(s), \phi_2(s)\} = $
	a) $\int_{0}^{t} f_1(u) f_2(t-u) du$	b) $\int_{0}^{\infty} f_1(u)f_2(t-u)du$
	c) $\int_{0}^{t} f_1(u) f_2(u) du$	d) $\int_{0}^{\infty} f_1(u) f_2(u) du$
6)	If $\bar{x} = 70, \bar{y} = 149, b_{yx} = 0.7$ then the	he equation of the line of regression of
	y on x is	b) $x = 0.7 + 0.0$
	a) $y = 0.7x + 60$ c) $y = 0.7x + 100$	b) $y = 0.7x + 80$ d) $y = 0.7x + 120$
_`	· · · · · · · · · · · ·	

7) If a random variable x has a Poisson distribution with mean 3, then P(x = 4) =\_\_\_\_\_. a) 0.11 b) 0.13

/	0.11		0.10
C)	0.15	d)	0.17

- 8) In solving algebraic and transcendental equation, which of the following method is called method of chord?
  - a) Newton's Raphson b) Regula Falsi
  - c) Iteration method d) Bisection method
- 9) In solving simultaneous linear equation, which of the following method is direct method?
  - a) Gauss elimination
- b) Gauss Jacobi'sd) Gauss Seidal
- c) Newton's Raphson d) Gauss Se
- 10) Fourier series of  $f(x) = 1 x^2$  in (-1, 1) contains \_\_\_\_\_. a) only sine series b) only cosine series
  - c) both sine and cosine series d) none of these
- 11) In the interval (0, 2) the constant term in the Fourier series of f(x) = x is \_\_\_\_\_.
  - a) 1 b) 2 c) 3 d) 0

12) Fourier cosine transform of  $e^{-x}$  for  $x \ge 0$  is \_\_\_\_\_. a)  $\frac{s}{1+s^2}$  b)  $\sqrt{\frac{2}{\pi}} \frac{s}{s^2+1}$ c)  $\sqrt{\frac{\pi}{2}} \frac{1}{1+s^2}$  d)  $\sqrt{\frac{2}{\pi}} \frac{1}{1+s^2}$ 

Set P

13)	If $z\{f(k)\} = F(z)$ , then $Z\{k, f(k)\} =$		·
	a) $\frac{dF(z)}{dz}$	b)	$z\frac{dF(z)}{dz}$
	c) $-z \frac{dF(z)}{dz}$	d)	$-\frac{dF(z)}{dz}$
14)	For $ z  > 1$ , the inverse z-Transform	of $\frac{z}{z-1}$	is
	a) $1, k \ge 0$ c) $2^k k \le 0$	b) d)	$2^k, k \ge 0$ not exists
	o, 2,	~)	

Seat No.

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

Instructions: 1) All questions are compulsory.

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- 3) Assume suitable data if necessary.
- 4) Use of non-programmable calculators is allowed.

### Section – I

## Q.2 Attempt any three of the following question.

a) In an experiment with 500 seeds in group of 5 the following results were obtained

<i>x</i> :	0	1	2	3	4	5	Total
<i>f</i> :	10	70	150	160	80	30	500

Where f denote the number of groups in which x seeds germinated. Fit a binominal distributed to the data.

**b)** Solve  $(D^2 - 5D + 6)y = \sin 3x$ 

c) Find 
$$L\{te^{-3t}\sin t\}$$

**d)** Evaluate  $\int_{0} \frac{\sin 2t}{t} dt$  by using Laplace transform.

**e)** Find inverse Laplace transform of  $\log\left(1 + \frac{a^2}{s^2}\right)$ 

## Q.3 Attempt any three of the following question..

- a) If the probability that an individual suffers a bad reaction from a particular injection is 0.001, determine the probability that out of 2000 individuals
  - 1) exactly four
  - 2) more than two individuals will suffer from bad reaction
- **b)** Solve  $(D^2 + 2D + 1)y = x \cos x$

**c)** Find 
$$L\left\{\frac{e^{-3t}\sin 5t}{t}\right\}$$

- **d)** Find the Laplace transform of  $(1 + 2t 3t^2 + 4t^3) \cdot H(t 2)$ .
- e) Using convolution theorem find inverse Laplace transform of  $\frac{1}{s(s^2+4)}$

09

09

Set P

Max. Marks: 56

## SLR-FM-227

Attempt any two of the following question.
a) From the following data find line of regression of x on y & estimate x when y = 105

5										
<i>x</i> :	44	58	49	46	58	56	48	46	48	47
<i>y</i> :	88	114	102	113	91	89	102	93	114	94

**b)** An electrical circuit consists of an inductance *L*,a condenser of capacity *C* & an e.m.f.  $E = E_0 \cos wt$  so that the charge *Q* satisfies the differential equation  $\frac{d^2Q}{dt^2} + \frac{Q}{LC_1} = \frac{E_0}{L} \cdot \cos wt$ 

If  $w = \frac{1}{\sqrt{Lc}} \&$  initially  $Q = Q_0$  at t = 0 & the current is  $i = i_0$  at t = 0. show that the charge Q at time t is given by

$$Q = Q_0 \cos wt + \frac{i_0}{w} \sin wt + \frac{E_0}{2Lw} t \sin wt$$

c) Solve by using Laplace transform

Q.4

 $(D^2 + 25)y = 10\cos 5t, y(0) = 2 \& y'(0) = 0$ 

#### Section-II

### Q.5 Attempt any three of the following questions.

a) Solve the following set of equations by Gauss Elimination method. 2m + 4m + 5 = -10, 2m + 9 = -12, 5m - 2m + 7 = -20

3x + 4y + 5z = 18, 2x - y + 8z = 13, 5x - 2y + 7z = 20.

- b) Solve the equation  $x \tan x + 1 = 0$  by Regula Falsi method starting with a = 2.5 and b = 3 correct to three decimal places.
- c) Expand  $x^2$  as a Fourier series in interval (-1, 1)
- **d**) Find z –transform of the sequence

$$f(k) = 3^k, \quad k < 0$$

$$=2^k, k \ge 0$$

e) Find the Fourier Sine transform of  $f(x) = 2e^{-5x} + 5e^{-2x}$  where  $x \ge 0$ 

#### Q.6 Attempt any three of the following questions.

- a) Find a posite real root of  $2x^3 3x 6 = 0$  by Newton's Raphson method correct to five places of decimal.
- **b)** Obtain half range sine series of  $f(x) = lx x^2$  in the interval (0, l).
- **c)** Find z-tranform of the sequence  $\{k^2 a^k\}$  where  $k \ge 0$
- **d)** Express the function f(x) = 1  $0 \le x < \pi$

$$0 \quad x > \pi$$

as a Fourier sine integral representation

e) Solve the following system of equation by Gauss-Seidal method correct to three decimal places.

$$x + y + 54z = 110$$
,  $27x + 6y - z = 85$ ,  $6x + 15y + 2z = 72$ 

09

10

SLR-FM-227

# Set P



## Q.7 Attempt any two of the following questions.

- a) Find the Fourier series of the function
- (a) Find the Fourier series of the function  $f(x) = \pi x \quad 0 < x < 1$   $= 0 \quad 1 < x < 2$ (b) Find inverse z-transform of  $\frac{2z^2 - 5z}{(z-2)(z-3)}$  where |z| > 3(c) Find the Fourier transform of the function  $f(x) = 1 - x^2 \quad |x| \le 1$   $= 0 \quad |x| > 1$ Hence evaluate  $\int_{0}^{\infty} \left(\frac{\sin x - x \cos x}{x^3}\right) \cos\left(\frac{x}{2}\right) dx$

## Seat No.

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## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

c)

a)  $1 \pm c^2$ 

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

- 1) In solving algebraic and transcendental equation, which of the following method is called method of chord?
  - a) Newton's Raphson b)
  - c) Iteration method d) Bisecti
- 2) In solving simultaneous linear equation, which of the following method is direct method?
  - a) Gauss eliminationc) Newton's Raphson
- b) Gauss Jacobi'sd) Gauss Seidal
- 3) Fourier series of  $f(x) = 1 x^2$  in (-1, 1) contains \_\_\_\_\_.
  - a) only sine series
- b) only cosine seriesd) none of these

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**h**)

- 4) In the interval (0, 2) the constant term in the Fourier series of f(x) = x is \_\_\_\_\_.
  - a) 1 b) 2
  - c) 3 d)

both sine and cosine series

5) Fourier cosine transform of  $e^{-x}$  for  $x \ge 0$  is \_\_\_\_\_.

c) 
$$\sqrt{\frac{\pi}{2}} \frac{1}{1+s^2}$$
 d)  $\sqrt{\frac{\pi}{\pi}} \frac{1}{s^2+1}$ 

 $\int_{-\infty}^{\infty} \frac{s}{s^2 + 1}$ 

Max. Marks: 70

Set

- Marks: 14
- Regula Falsi Bisection method

Set Q

6) If 
$$z\{f(k)\} = F(z)$$
, then  $Z\{k, f(k)\} =$ \_\_\_\_\_\_.  
a)  $\frac{dF(z)}{dz}$  b)  $z\frac{dF(z)}{dz}$   
c)  $-z\frac{dF(z)}{dz}$  d)  $-\frac{dF(z)}{dz}$   
7) For  $|z| > 1$ , the inverse z-Transform of  $\frac{z}{z-1}$  is \_\_\_\_\_\_.  
a) 1,  $k \ge 0$  b)  $2^k, k \ge 0$   
c)  $2^k, k < 0$  d) not exists  
8) The general solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_\_.  
a)  $y = (c_1 + c_2 x) e^x + (c_3 + c_4 x) e^{-x}$   
b)  $y = (c_1 + c_2 x) \cos \sqrt{3} x + (c_3 + c_4 x) \sin \sqrt{3} x$   
c)  $y = (c_1 + c_2 x) \cos \sqrt{3} x + (c_3 + c_4 x) \sin \sqrt{3} x$   
c)  $y = (c_1 + c_2 x) \cos \sqrt{3} x + (c_3 + c_4 x) \sin x^2$   
9) The particular integral of  $(D^4 - n^4)y = \sin nx$  is  
a)  $\frac{x}{4n^3} \sin nx$  b)  $-\frac{x}{4n^3} \cos nx$   
c)  $\frac{x}{4n^3} \cos nx$  d)  $-\frac{x}{4n^3} \sin nx$   
10) If  $f(t) = f(t + T)$  where T is period of  $f(t)$  then  $L\{f(t)\} =$ \_\_\_\_\_\_\_.  
a)  $\frac{1}{1 - e^{-Ts}} \int_{0}^{T} e^{-St} f(t) dt$  b)  $\frac{1}{1 - e^{-Ts}} \int_{0}^{T} e^{-St} f(t) dt$   
11)  $L^{-1} \{\frac{s+3}{s^2+3^2}\} =$ \_\_\_\_\_\_\_.  
a)  $\cos 3t$  b)  $\sin 3t$   
c)  $3t + \cos 3t$  d)  $\cos 3t + \sin 3t$   
12) If  $L\{f_1(t)\} = \phi_1(s) \& L\{f_2(t)\} = \phi_2(s)$  then  $L^{-1}_{\infty} \{\phi_1(s), \phi_2(s)\} =$ \_\_\_\_\_\_\_.  
a)  $\int_{0}^{t} f_1(u)f_2(t-u)du$  b)  $\int_{0}^{t} f_1(u)f_2(t-u)du$   
c)  $\int_{0}^{t} f_1(u)f_2(u)du$  d)  $\int_{0}^{\infty} f_1(u)f_2(u)du$ 

# Set Q

- 13) If  $\bar{x} = 70$ ,  $\bar{y} = 149$ ,  $b_{yx} = 0.7$  then the equation of the line of regression of y on x is
  - a) y = 0.7x + 60 b) y = 0.7x + 80
  - c) y = 0.7x + 100 d) y = 0.7x + 120
- 14) If a random variable *x* has a Poisson distribution with mean 3, then P(x = 4) =\_\_\_\_\_.
  - a) 0.11 b) 0.13
  - c) 0.15 d) 0.17

Seat No.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III

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

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## Section – I

## Q.2 Attempt any three of the following question.

a) In an experiment with 500 seeds in group of 5 the following results were obtained

<i>x</i> :	0	1	2	3	4	5	Total
f:	10	70	150	160	80	30	500

Where f denote the number of groups in which x seeds germinated. Fit a binominal distributed to the data.

**b)** Solve  $(D^2 - 5D + 6)y = \sin 3x$ 

c) Find 
$$L\{te^{-3t} \sin t\}$$
  
d) Evaluate  $\int_{0}^{\infty} \frac{\sin 2t}{t} dt$  by using Laplace transform.

**e)** Find inverse Laplace transform of  $\log\left(1 + \frac{a^2}{s^2}\right)$ 

## Q.3 Attempt any three of the following question..

- a) If the probability that an individual suffers a bad reaction from a particular injection is 0.001, determine the probability that out of 2000 individuals
  - 1) exactly four
  - 2) more than two individuals will suffer from bad reaction
- **b)** Solve  $(D^2 + 2D + 1)y = x \cos x$

**c)** Find 
$$L\left\{\frac{e^{-3t}\sin 5t}{t}\right\}$$

d) Find the Laplace transform of  $(1 + 2t - 3t^2 + 4t^3)$ . H(t - 2).

e) Using convolution theorem find inverse Laplace transform of  $\frac{1}{s(s^2+4)}$ 

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Max. Marks: 56

**SLR-FM-227** 

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## **SLR-FM-227**

## Set Q

## Q.4 Attempt any two of the following question.

a) From the following data find line of regression of x on y & estimate x when v = 105

<i>x</i> :	44	58	49	46	58	56	48	46	48	47
<i>y</i> :	88	114	102	113	91	89	102	93	114	94

**b)** An electrical circuit consists of an inductance L, a condenser of capacity C & an e.m.f.  $E = E_0 \cos wt$  so that the charge Q satisfies the differential equation  $\frac{d^2Q}{dt^2} + \frac{Q}{LC} = \frac{E_0}{L} \cdot \cos wt$ 

If  $w = \frac{1}{\sqrt{Lc}}$  & initially  $Q = Q_0$  at t = 0 & the current is  $i = i_0$  at t = 0. show that the charge Q at time t is given by

$$Q = Q_0 \cos wt + \frac{i_0}{w} \sin wt + \frac{E_0}{2Lw} t \sin wt$$

c) Solve by using Laplace transform

$$(D^{2} + 25)y = 10\cos 5t, y(0) = 2 \& y'(0) = 0$$

#### Section-II

#### Q.5 Attempt any three of the following questions.

Solve the following set of equations by Gauss Elimination method. a)

3x + 4y + 5z = 18, 2x - y + 8z = 13, 5x - 2y + 7z = 20.

- Solve the equation  $x \tan x + 1 = 0$  by Regula Falsi method starting with b) a = 2.5 and b = 3 correct to three decimal places.
- Expand  $x^2$  as a Fourier series in interval (-1, 1) c)
- Find z –transform of the sequence d)

$$f(k) = 3^k, \quad k < 0$$
  
= 2<sup>k</sup>,  $k \ge 0$ 

Find the Fourier Sine transform of  $f(x) = 2e^{-5x} + 5e^{-2x}$  where  $x \ge 0$ e)

#### Attempt any three of the following questions. Q.6

- a) Find a posite real root of  $2x^3 3x 6 = 0$  by Newton's Raphson method correct to five places of decimal.
- **b)** Obtain half range sine series of  $f(x) = lx x^2$  in the interval (0, l).
- c) Find z-tranform of the sequence  $\{k^2 a^k\}$  where  $k \ge 0$
- **d)** Express the function f(x) = 1  $0 \le x < \pi$  $= 0 \quad x > \pi$

as a Fourier sine integral representation

e) Solve the following system of equation by Gauss-Seidal method correct to three decimal places.

$$x + y + 54z = 110$$
,  $27x + 6y - z = 85$ ,  $6x + 15y + 2z = 72$ 

10



## Q.7 Attempt any two of the following questions.

a) Find the Fourier series of the function

$$\begin{array}{rcl} f(x) &=& \pi x & 0 < x < 1 \\ &=& 0 & 1 < x < 2 \end{array}$$

- Find inverse z-transform of  $\frac{2z^2-5z}{(z-2)(z-3)}$  where |z| > 3Find the Fourier transform of the function  $f(x) = 1 x^2$   $|x| \le 1$ b)
- c)

$$f(x) = 1 - x^2 \quad |x| \le 1$$
$$= 0 \quad |x| > 1$$
Hence evaluate

$$\int_{0}^{\infty} \left( \frac{\sin x - x \cos x}{x^3} \right) \cos \left( \frac{x}{2} \right) dx$$

No.		3
	S.E. (Part – I) (I	New/Old) (CBCS) Examination Nov/Dec-2019
	Electron	ics & Telecommunication Engineering

ENGINEERING MATHEMATICS – III Day & Date: Saturday, 07-12-2019

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## **MCQ/Objective Type Questions**

Duration: 30 Minutes

1)

Seat

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

- If  $L\{f_1(t)\} = \phi_1(s) \& L\{f_2(t)\} = \phi_2(s)$  then  $L^{-1}\{\phi_1(s), \phi_2(s)\} =$ \_\_\_\_\_\_. a)  $\int_0^t f_1(u)f_2(t-u)du$ b)  $\int_0^\infty f_1(u)f_2(t-u)du$ c)  $\int_0^t f_1(u)f_2(u)du$ d)  $\int_0^\infty f_1(u)f_2(u)du$
- 2) If  $\bar{x} = 70$ ,  $\bar{y} = 149$ ,  $b_{yx} = 0.7$  then the equation of the line of regression of y on x is

a)	y = 0.7x + 60	b)	y = 0.7x + 80
C)	y = 0.7x + 100	d)	y = 0.7x + 120

## 3) If a random variable x has a Poisson distribution with mean 3, then

- P(x = 4) =\_\_\_\_\_. a) 0.11 b) 0.13
- c) 0.15 d) 0.17
- 4) In solving algebraic and transcendental equation, which of the following method is called method of chord?
  - a) Newton's Raphson b) Regula Falsi
  - c) Iteration method d) Bisection method
- 5) In solving simultaneous linear equation, which of the following method is direct method?
  - a) Gauss elimination b) Gauss Jacobi's
  - c) Newton's Raphson d) Gauss Seidal

Max. Marks: 70

Marks: 14

Set | R Fourier series of  $f(x) = 1 - x^2$  in (-1, 1) contains \_\_\_\_\_. 6) a) only sine series only cosine series b) both sine and cosine series c) d) none of these In the interval (0, 2) the constant term in the Fourier series of f(x) = x is \_\_\_\_\_. 7) b) 2 a) 1 c) 3 d) 0 8) Fourier cosine transform of  $e^{-x}$  for  $x \ge 0$  is b)  $\sqrt{\frac{2}{\pi}} \frac{s}{s^2 + 1}$  $1 + s^2$ a) d)  $\sqrt{\frac{2}{\pi} \frac{1}{1+s^2}}$ c)  $\sqrt{\frac{\pi}{2}} \frac{1}{1+s^2}$ If  $z\{f(k)\} = F(z)$ , then  $Z\{k, f(k)\} =$ \_\_\_\_\_. b)  $z \frac{dF(z)}{dz}$ 9) c)  $-z \frac{dF(z)}{dz}$ d)  $-\frac{dF(z)}{dz}$ 10) For |z| > 1, the inverse z-Transform of  $\frac{z}{z-1}$  is \_\_\_\_\_. b)  $\tilde{2}^k, k \ge 0$ a)  $1, k \ge 0$ c)  $2^k, k < 0$ d) not exists The general solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_. 11) a)  $y = (c_1 + c_2 x) e^x + (c_3 + c_4 x) e^{-x}$ b)  $y = (c_1 + c_2 x) \cos \sqrt{3} x + (c_3 + c_4 x) \sin \sqrt{3} x$ c)  $y = (c_1 + c_2 x) e^{-x} + (c_3 + c_4 x) e^x$ d)  $y = (c_1 + c_2 \cos x) e^x + (c_3 + c_4 \sin x) e^x$ The particular integral of  $(D^4 - n^4)y = \sin nx$  is 12) b)  $-\frac{x}{4n^3}\cos nx$ a)  $\frac{x}{4n^3}\sin nx$ C) ıx

$$\frac{x}{4n^3}\cos nx \qquad \qquad \text{d)} \quad -\frac{x}{4n^3}\sin n$$

**SLR-FM-227** 

Set R

13) If 
$$f(t) = f(t+T)$$
 where *T* is period of  $f(t)$  then  $L\{f(t)\} =$  \_\_\_\_\_\_.  
a)  $\frac{1}{1-e^{-Ts}} \int_{0}^{T} e^{-st} f(t) dt$  b)  $\frac{1}{1-e^{Ts}} \int_{0}^{T} e^{-st} f(t) dt$   
c)  $\frac{1}{1-e^{st}} \int_{0}^{T} e^{-ST} f(t) dt$  d)  $\frac{1}{1-e^{-st}} \int_{0}^{T} e^{ST} f(t) dt$   
14)  $L^{-1} \{ \frac{s+3}{s^2+3^2} \} =$  \_\_\_\_\_\_.  
a)  $\cos 3t$  b)  $\sin 3t$   
c)  $3t + \cos 3t$  d)  $\cos 3t + \sin 3t$ 

Seat	
No.	

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### Section – I

## Q.2 Attempt any three of the following question.

a) In an experiment with 500 seeds in group of 5 the following results were obtained

<i>x</i> :	0	1	2	3	4	5	Total
f:	10	70	150	160	80	30	500

Where f denote the number of groups in which x seeds germinated. Fit a binominal distributed to the data.

**b)** Solve  $(D^2 - 5D + 6)y = \sin 3x$ 

c) Find 
$$L\{te^{-3t} \sin t\}$$
  
d) Evaluate  $\int_{0}^{\infty} \frac{\sin 2t}{t} dt$  by using Laplace transform.

**e)** Find inverse Laplace transform of  $\log\left(1 + \frac{a^2}{s^2}\right)$ 

### Q.3 Attempt any three of the following question..

- a) If the probability that an individual suffers a bad reaction from a particular injection is 0.001, determine the probability that out of 2000 individuals
   1) exactly four
  - 2) more than two individuals will suffer from bad reaction
- **b)** Solve  $(D^2 + 2D + 1)y = x \cos x$

**c)** Find 
$$L\left\{\frac{e^{-3t}\sin 5t}{t}\right\}$$

**d)** Find the Laplace transform of  $(1 + 2t - 3t^2 + 4t^3)$ . H(t - 2).

e) Using convolution theorem find inverse Laplace transform of  $\frac{1}{s(s^2+4)}$ 

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SLR-FM-227

Max. Marks: 56

### Q.4 Attempt any two of the following question.

a) From the following data find line of regression of x on y & estimate x when y = 105

<i>x</i> :	44	58	49	46	58	56	48	46	48	47
<i>y</i> :	88	114	102	113	91	89	102	93	114	94

**b)** An electrical circuit consists of an inductance *L*,a condenser of capacity *C* & an e.m.f.  $E = E_0 \cos wt$  so that the charge *Q* satisfies the differential equation  $\frac{d^2Q}{dt^2} + \frac{Q}{LC_1} = \frac{E_0}{L} \cdot \cos wt$ 

If  $w = \frac{1}{\sqrt{Lc}} \&$  initially  $Q = Q_0$  at t = 0 & the current is  $i = i_0$  at t = 0. show that the charge Q at time t is given by

$$Q = Q_0 \cos wt + \frac{i_0}{w} \sin wt + \frac{E_0}{2Lw} t \sin wt$$

c) Solve by using Laplace transform

 $(D^2 + 25)y = 10\cos 5t, y(0) = 2 \& y'(0) = 0$ 

#### Section-II

### Q.5 Attempt any three of the following questions.

a) Solve the following set of equations by Gauss Elimination method. 2m + 4m + 5 = -10, 2m + 9 = -12, 5m - 2m + 7 = -20

3x + 4y + 5z = 18, 2x - y + 8z = 13, 5x - 2y + 7z = 20.

- b) Solve the equation  $x \tan x + 1 = 0$  by Regula Falsi method starting with a = 2.5 and b = 3 correct to three decimal places.
- **c)** Expand  $x^2$  as a Fourier series in interval (-1, 1)
- d) Find z –transform of the sequence

$$f(k) = 3^k, \quad k < 0$$

$$=2^k, k \ge 0$$

e) Find the Fourier Sine transform of  $f(x) = 2e^{-5x} + 5e^{-2x}$  where  $x \ge 0$ 

#### Q.6 Attempt any three of the following questions.

- a) Find a posite real root of  $2x^3 3x 6 = 0$  by Newton's Raphson method correct to five places of decimal.
- **b)** Obtain half range sine series of  $f(x) = lx x^2$  in the interval (0, l).
- **c)** Find z-tranform of the sequence  $\{k^2 a^k\}$  where  $k \ge 0$
- **d)** Express the function f(x) = 1  $0 \le x < \pi$

$$0 \quad x > \pi$$

as a Fourier sine integral representation

 e) Solve the following system of equation by Gauss-Seidal method correct to three decimal places.

$$x + y + 54z = 110$$
,  $27x + 6y - z = 85$ ,  $6x + 15y + 2z = 72$ 

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**SLR-FM-227** 



## Q.7 Attempt any two of the following questions.

- a) Find the Fourier series of the function
- (a) Find the Fourier series of the function  $f(x) = \pi x \quad 0 < x < 1$   $= 0 \quad 1 < x < 2$ (b) Find inverse z-transform of  $\frac{2z^2 - 5z}{(z-2)(z-3)}$  where |z| > 3(c) Find the Fourier transform of the function  $f(x) = 1 - x^2 \quad |x| \le 1$   $= 0 \quad |x| > 1$ Hence evaluate  $\int_{0}^{\infty} \left(\frac{\sin x - x \cos x}{x^3}\right) \cos\left(\frac{x}{2}\right) dx$

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## Seat No.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III**

Day & Date: Saturday, 07-12-2019

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) Use of non programmable scientific calculator allowed.
  - 3) Figures to the right indicate full marks.
  - 4) 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

- Fourier series of  $f(x) = 1 x^2$  in (-1, 1) contains \_\_\_\_\_. 1)
  - a) only sine series
  - both sine and cosine series d) c)

#### In the interval (0, 2) the constant term in the Fourier series of f(x) = x is \_\_\_\_\_. 2)

- a) 1 b) 2 d) 0 c) 3
- Fourier cosine transform of  $e^{-x}$  for  $x \ge 0$  is \_\_\_\_\_ 3) S b)  $\sqrt{\frac{2}{\pi}} \frac{s}{s^2 + 1}$ a)  $1 + s^2$ 
  - c)  $\sqrt{\frac{\pi}{2}} \frac{1}{1+s^2}$ d)  $\sqrt{\frac{2}{\pi}} \frac{1}{1+s^2}$
- If  $z\{f(k)\} = F(z)$ , then  $Z\{k, f(k)\} =$ \_\_\_\_\_. b)  $z \frac{dF(z)}{dz}$ 4) d)  $-\frac{dF(z)}{dz}$ c)  $-z \frac{dF(z)}{dz}$
- For |z| > 1, the inverse z-Transform of  $\frac{z}{z-1}$  is \_\_\_\_\_. a) 1 k > 0 b)  $2^k, k \ge 0$ 5)
  - c)  $2^k, k < 0$ d) not exists

**SLR-FM-227** 

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Max. Marks: 70

Marks: 14

only cosine series b) none of these

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The general solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_ 6) a)  $y = (c_1 + c_2 x) e^x + (c_3 + c_4 x) e^{-x}$ b)  $y = (c_1 + c_2 x) \cos \sqrt{3} x + (c_3 + c_4 x) \sin \sqrt{3} x$ c)  $y = (c_1 + c_2 x) e^{-x} + (c_3 + c_4 x) e^x$ d)  $y = (c_1 + c_2 \cos x)e^x + (c_3 + c_4 \sin x)e^x$ The particular integral of  $(D^4 - n^4)y = \sin nx$  is 7) a)  $\frac{x}{4n^3}\sin nx$ b)  $-\frac{x}{4n^3}\cos nx$ c)  $\frac{x}{4n^3}\cos nx$ d)  $-\frac{x}{4n^3}\sin nx$ If f(t) = f(t + T) where T is period of f(t) then  $L\{f(t)\} =$ \_\_\_\_\_. a)  $\frac{1}{1 - e^{-Ts}} \int_{0}^{T} e^{-st} f(t) dt$  b)  $\frac{1}{1 - e^{Ts}} \int_{0}^{T} e^{-st} f(t) dt$ 8) c)  $\frac{1}{1 - e^{st}} \int_{0}^{T} e^{-ST} f(t) dt$  d)  $\frac{1}{1 - e^{-st}} \int_{0}^{T} e^{ST} f(t) dt$ 9)  $L^{-1}\left\{\frac{s+3}{s^2+3^2}\right\} = \underline{\qquad}.$ a)  $\cos 3t$ c)  $3t + \cos 3t$ b) sin 3t d)  $\cos 3t + \sin 3t$ 10) If  $L\{f_1(t)\} = \phi_1(s) \& L\{f_2(t)\} = \phi_2(s)$  then  $L^{-1}\{\phi_1(s), \phi_2(s)\} =$ \_\_\_\_\_\_. a)  $\int_0^t f_1(u)f_2(t-u)du$ b)  $\int_0^\infty f_1(u)f_2(t-u)du$ c)  $\int_0^t f_1(u)f_2(u)du$ d)  $\int_0^\infty f_1(u)f_2(u)du$ If  $\bar{x} = 70$ ,  $\bar{y} = 149$ ,  $b_{yx} = 0.7$  then the equation of the line of regression of 11) y on x is a) y = 0.7x + 60b) y = 0.7x + 80

- c) y = 0.7x + 100d) y = 0.7x + 120
- 12) If a random variable x has a Poisson distribution with mean 3, then P(x = 4) =\_\_\_\_\_\_. a) 0.11 b) 0.13
  - c) 0.15 d) 0.17



- In solving algebraic and transcendental equation, which of the following 13) method is called method of chord?
  - a) Newton's Raphson
  - c) Iteration method
- b) Regula Falsi
- **Bisection method** d)
- In solving simultaneous linear equation, which of the following method is 14) direct method?
  - a) Gauss elimination
- b) Gauss Jacobi's
- c) Newton's Raphson
- d) Gauss Seidal

## Seat No.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III

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

## Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of non-programmable calculators is allowed.

## Section – I

## Q.2 Attempt any three of the following question.

a) In an experiment with 500 seeds in group of 5 the following results were obtained

<i>x</i> :	0	1	2	3	4	5	Total
f:	10	70	150	160	80	30	500

Where f denote the number of groups in which x seeds germinated. Fit a binominal distributed to the data.

**b)** Solve  $(D^2 - 5D + 6)y = \sin 3x$ 

c) Find 
$$L\{te^{-3t} \sin t\}$$
  
d) Evaluate  $\int_{0}^{\infty} \frac{\sin 2t}{t} dt$  by using Laplace transform.

**e)** Find inverse Laplace transform of  $\log\left(1 + \frac{a^2}{s^2}\right)$ 

## Q.3 Attempt any three of the following question..

- a) If the probability that an individual suffers a bad reaction from a particular injection is 0.001, determine the probability that out of 2000 individuals
  - 1) exactly four
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- **b)** Solve  $(D^2 + 2D + 1)y = x \cos x$

**c)** Find 
$$L\left\{\frac{e^{-3t}\sin 5t}{t}\right\}$$

d) Find the Laplace transform of  $(1 + 2t - 3t^2 + 4t^3)$ . H(t - 2).

e) Using convolution theorem find inverse Laplace transform of  $\frac{1}{s(s^2+4)}$ 

09

09

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Max. Marks: 56

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#### Q.4 Attempt any two of the following question.

a) From the following data find line of regression of x on y & estimate x when y = 105

<i>x</i> :	44	58	49	46	58	56	48	46	48	47
<i>y</i> :	88	114	102	113	91	89	102	93	114	94

**b)** An electrical circuit consists of an inductance *L*,a condenser of capacity *C* & an e.m.f.  $E = E_0 \cos wt$  so that the charge *Q* satisfies the differential equation  $\frac{d^2Q}{dt^2} + \frac{Q}{LC} = \frac{E_0}{L} \cdot \cos wt$ 

If  $w = \frac{1}{\sqrt{Lc}} \&$  initially  $Q = Q_0$  at t = 0 & the current is  $i = i_0$  at t = 0. show that the charge Q at time t is given by

$$Q = Q_0 \cos wt + \frac{i_0}{w} \sin wt + \frac{E_0}{2Lw} t \sin wt$$

c) Solve by using Laplace transform

 $(D^2 + 25)y = 10\cos 5t, y(0) = 2 \& y'(0) = 0$ 

#### Section-II

#### Q.5 Attempt any three of the following questions.

a) Solve the following set of equations by Gauss Elimination method. 2w + 4w + 5z = 10, 2w + 9z = 12, 5w + 7z = 20

3x + 4y + 5z = 18, 2x - y + 8z = 13, 5x - 2y + 7z = 20.

- b) Solve the equation  $x \tan x + 1 = 0$  by Regula Falsi method starting with a = 2.5 and b = 3 correct to three decimal places.
- c) Expand  $x^2$  as a Fourier series in interval (-1, 1)
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$$f(k) = 3^k, \quad k < 0$$

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#### Q.6 Attempt any three of the following questions.

- a) Find a posite real root of  $2x^3 3x 6 = 0$  by Newton's Raphson method correct to five places of decimal.
- **b)** Obtain half range sine series of  $f(x) = lx x^2$  in the interval (0, l).
- **c)** Find z-tranform of the sequence  $\{k^2 a^k\}$  where  $k \ge 0$
- **d)** Express the function f(x) = 1  $0 \le x < \pi$

$$0 \quad x > \pi$$

as a Fourier sine integral representation

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$$x + y + 54z = 110$$
,  $27x + 6y - z = 85$ ,  $6x + 15y + 2z = 72$ 

Set S

09



## Q.7 Attempt any two of the following questions.

- a) Find the Fourier series of the function
- (a) Find the Fourier series of the function  $f(x) = \pi x \quad 0 < x < 1$   $= 0 \quad 1 < x < 2$ (b) Find inverse z-transform of  $\frac{2z^2 - 5z}{(z-2)(z-3)}$  where |z| > 3(c) Find the Fourier transform of the function  $f(x) = 1 - x^2 \quad |x| \le 1$   $= 0 \quad |x| > 1$ Hence evaluate  $\int_{0}^{\infty} \left(\frac{\sin x - x \cos x}{x^3}\right) \cos\left(\frac{x}{2}\right) dx$

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – 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.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

- The ripple factor is independent of resistance in filter. 1)
  - a) L
  - c) С d) CLC
- Load regulation of ideal power supply must be \_\_\_\_\_. 2)
  - a) Zero b) Infinite
  - c) Large
- 3) PIV of rectifier diode depends upon \_\_\_\_\_
  - Maximum reverse voltage across it a)
    - Maximum forward voltage across it b)
    - Type of semiconductor material used c)
    - d) None of these
- 4) Load regulation can be improved in LC filter by \_\_\_\_\_.
  - Inductor filter b) Using capacitor filter a) c)
    - Using bleeder resistor d) Using bleeder capacitor
- 5) If one of the diode in centre tapped full wave rectifier circuit get damaged it act like
  - b) Half wave rectifier a) Clamper circuit
  - c) Both a & b d) Cant say
- Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature. 6)
  - a) Half, 10°C b) Triple, 30°C
  - Double, 10°C d) Constant. 10°C c)
- 7) The critical value of inductance in choke input filter is \_\_\_\_\_.
  - b)  $R_L/3\omega$ a)  $3\omega/R_L$
  - c)  $3\omega R_L$ d) R<sub>L</sub>
- Which are the majority charge carriers in P-channel JFET by enhancing 8) the flow of current between two N-regions or gates?
  - Holes b) Electrons a)
  - Both a & b d) None of the above c)



Marks: 14

b) LC

- d) None of these

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- 9) Which internally connected region is heavily doped with an impurity by forming double PN junctions in JFET?
   a) Source
   b) Drain
  - a) Source c) Gate
    - d) Channel
- 10) The output voltage of common base amplifier is \_\_\_\_\_ with input signal.
  - a) in phase b) 270°
  - c) 90° out of phase d) 180°
- 11) The total emitter current (I<sub>E</sub>) is given by \_\_\_\_\_.
  - a)  $I_E = I_{pE} * I_{nE}$  b)  $I_E = I_{pE} I_{nE}$
  - c)  $I_E = I_{pE} / I_{nE}$  d)  $I_E = I_{pE} + I_{nE}$
- 12) The correct relation between the transistor parameters  $\alpha$  and  $\beta$  are related by \_\_\_\_\_.
  - a)  $\beta = 1 \alpha/\alpha$ b)  $\beta = 1 + \alpha/\alpha$ c)  $\alpha = \beta + 1/\beta$ d)  $\alpha = \beta/\beta + 1$
- 13) The Early Effect is also called as \_\_\_\_\_
  - a) Base-width modulation effect
  - b) Base-width amplification effect
  - c) Punch through effect
  - d) None of the mentioned
- 14) Which of the following acts as a buffer?
  - a) CC amplifier b)
- b) CE amplifier
  - d) Cascaded amplifier
  - c) CB amplifier

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## Seat No.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

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

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

## Section – I

## Q.2 Solve any four

- a) What is PIV rating of diode? What is value of PIV for centre tapped full wave rectifier explain with neat circuit diagram.
- b) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.
- c) Explain with neat circuit diagram working of voltage Tripler.

4

d) Draw output waveform and transfer characteristics for following circuit.



e) Derive expression for efficiency and ripple factor for half wave rectifier.

## Q.3 Solve any two.

- a) Design unregulated power supply with two diode and CLC filter to provide 20V and 10mA current, ripple content in the output must be less than 1%.
- **b)** Explain depletion and diffusion capacitance of diode and derive expression of diffusion capacitance.
- c) What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. Explain working of voltage doubler.

## Section – II

## Q.4 Solve any four questions.

a) Design Collector to base biasing circuit for

 $V_{CEO} = 5V, I_{CO} = 5mA, Vcc = 12 V, \beta dc = 120.$ 

- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain DC load line concept in BJT CE amplifier.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.

Max. Marks: 56

16

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## Q.5 Solve any Two questions.

- a) Consider transistor CE amplifier with  $RL = 2.7K\Omega$ , hie =  $4.5K\Omega$ , hre =  $2 \times 10^{-4}$ , hfe =-330, hoe =  $30\mu$ °. Calculate Ai, Av, Ri, Ro, Ap.
- **b)** Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vopeak = 4V and stability factor S=10. Assume hfe = 45, hie = 1.4K $\Omega$ .
- c) Explain Common Source JFET amplifier with its basic parameters.

## Set S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – 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.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

2)

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

- Which are the majority charge carriers in P-channel JFET by enhancing 1) the flow of current between two N-regions or gates?
  - Holes a)

- d) None of the above
- c) Both a & b Which internally connected region is heavily doped with an impurity by
- forming double PN junctions in JFET?
  - a) Source b) Drain
  - Gate d) Channel c)
- The output voltage of common base amplifier is \_\_\_\_\_ with input signal. 3)
  - in phase b) 270° a) c) 90° out of phase d) 180°
- 4) The total emitter current  $(I_E)$  is given by \_\_\_\_\_.

a)	$I_E = I_{pE} * I_{nE}$	b) $I_E = I_{pE} - I_{nE}$	
C)	$I_E = I_{pE} / I_{nE}$	d) $I_E = I_{pE} + I_{nE}$	

- 5) The correct relation between the transistor parameters  $\alpha$  and  $\beta$  are related by \_\_\_\_\_.
  - a)  $\beta = 1 \alpha / \alpha$ b)  $\beta = 1 + \alpha/\alpha$  $\alpha = \beta + 1/\beta$ d)  $\alpha = \beta/\beta + 1$ c)
- The Early Effect is also called as 6)
  - Base-width modulation effect a)
  - Base-width amplification effect b)
  - Punch through effect c)
  - None of the mentioned d)
- 7) Which of the following acts as a buffer?
  - CC amplifier b) CE amplifier a) **CB** amplifier d) Cascaded amplifier c)
- The ripple factor is independent of resistance in filter. 8)
  - a) L b) LC
  - c) С d) CLC
- Load regulation of ideal power supply must be \_\_\_\_\_ 9)
  - a) Zero b) Infinite
  - Large d) None of these C)



Marks: 14

- b) Electrons

Set Q

- 10) PIV of rectifier diode depends upon \_\_\_\_\_.
  - Maximum reverse voltage across it a)
  - Maximum forward voltage across it b)
  - c) Type of semiconductor material used
  - d) None of these

a)

- 11) Load regulation can be improved in LC filter by \_\_\_\_\_. Inductor filter
  - b) Using capacitor filter
  - Using bleeder resistor d) Using bleeder capacitor C)
- 12) If one of the diode in centre tapped full wave rectifier circuit get damaged it act like \_\_\_\_\_.
  - a) Clamper circuit

- b) Half wave rectifier
- c) Both a & b d) Cant say
- 13) Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature.
  - a) Half, 10°C b) Triple, 30°C
  - c) Double, 10°C d) Constant, 10°C
- 14) The critical value of inductance in choke input filter is \_\_\_\_\_.
  - a)  $3\omega/R_L$
  - c)  $3\omega R_L$

b)  $R_L/3\omega$ d) R<sub>L</sub>

## Seat No.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

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

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

## Section – I

## Q.2 Solve any four

- a) What is PIV rating of diode? What is value of PIV for centre tapped full wave rectifier explain with neat circuit diagram.
- b) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.
- c) Explain with neat circuit diagram working of voltage Tripler.

4

d) Draw output waveform and transfer characteristics for following circuit.



e) Derive expression for efficiency and ripple factor for half wave rectifier.

## Q.3 Solve any two.

- a) Design unregulated power supply with two diode and CLC filter to provide 20V and 10mA current, ripple content in the output must be less than 1%.
- **b)** Explain depletion and diffusion capacitance of diode and derive expression of diffusion capacitance.
- c) What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. Explain working of voltage doubler.

## Section – II

## Q.4 Solve any four questions.

a) Design Collector to base biasing circuit for

 $V_{CEO} = 5V, I_{CO} = 5mA, Vcc = 12 V, \beta dc = 120.$ 

- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain DC load line concept in BJT CE amplifier.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.

Max. Marks: 56

16

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Set Q

## Q.5 Solve any Two questions.

- a) Consider transistor CE amplifier with  $RL = 2.7K\Omega$ , hie =  $4.5K\Omega$ , hre =  $2 \times 10^{-4}$ , hfe =-330, hoe =  $30\mu$ °. Calculate Ai, Av, Ri, Ro, Ap.
- **b)** Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vopeak = 4V and stability factor S=10. Assume hfe = 45, hie = 1.4K $\Omega$ .
- c) Explain Common Source JFET amplifier with its basic parameters.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – 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.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

- If one of the diode in centre tapped full wave rectifier circuit get damaged it 1) act like . b) Half wave rectifier
  - Clamper circuit a)

Both a & b

c)

- Both a & b c)
- 2) Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature.
  - Half. 10°C b) Triple, 30°C a) C)
    - Double, 10°C d) Constant, 10°C
- The critical value of inductance in choke input filter is . 3)
  - b)  $R_L/3\omega$ a)  $3\omega/R_{\rm L}$ d) R<sub>L</sub> C)  $3\omega R_L$
- Which are the majority charge carriers in P-channel JFET by enhancing 4) the flow of current between two N-regions or gates? a) Holes
  - b) Electrons

d) Cant sav

- d) None of the above
- Which internally connected region is heavily doped with an impurity by 5) forming double PN junctions in JFET?
  - Source b) Drain a) Gate d) Channel C)
- The output voltage of common base amplifier is \_\_\_\_\_ with input signal. 6)
  - in phase b) 270° a) d) 180° c) 90° out of phase
- 7) The total emitter current (I<sub>E</sub>) is given by \_\_\_\_
  - b)  $I_E = I_{pE} I_{nE}$ a)  $I_E = I_{pE} * I_{nE}$ d)  $I_E = I_{pE} + I_{nE}$ C)  $I_E = I_{pE}/I_{nE}$
- 8) The correct relation between the transistor parameters  $\alpha$  and  $\beta$  are related by .
  - $\beta = 1 \alpha / \alpha$ b)  $\beta = 1 + \alpha/\alpha$ a)  $\alpha = \beta + 1/\beta$ d)  $\alpha = \beta/\beta + 1$ C)

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Max. Marks: 70

Marks: 14



- 9) The Early Effect is also called as \_\_\_\_\_.
  - Base-width modulation effect a)
  - Base-width amplification effect b)
  - Punch through effect c)

c)

a)

Zero

- None of the mentioned d)
- 10) Which of the following acts as a buffer? CC amplifier a)
  - b) CE amplifier
  - CB amplifier d) Cascaded amplifier
- 11) The ripple factor is independent of resistance in \_\_\_\_\_ filter.
  - b) LC a) L C)
    - d) CLC С
- 12) Load regulation of ideal power supply must be \_\_\_\_\_.
  - b) Infinite
  - C) Large d) None of these
- 13) PIV of rectifier diode depends upon \_
  - a) Maximum reverse voltage across it
  - Maximum forward voltage across it b)
  - Type of semiconductor material used c)
  - d) None of these
- 14) Load regulation can be improved in LC filter by \_\_\_\_\_.
  - a) Inductor filter

- b) Using capacitor filter
- Using bleeder resistor c)
- d) Using bleeder capacitor

## Seat No.

## S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

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

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

## Section – I

## Q.2 Solve any four

- a) What is PIV rating of diode? What is value of PIV for centre tapped full wave rectifier explain with neat circuit diagram.
- b) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.
- c) Explain with neat circuit diagram working of voltage Tripler.

4

d) Draw output waveform and transfer characteristics for following circuit.



e) Derive expression for efficiency and ripple factor for half wave rectifier.

## Q.3 Solve any two.

- a) Design unregulated power supply with two diode and CLC filter to provide 20V and 10mA current, ripple content in the output must be less than 1%.
- **b)** Explain depletion and diffusion capacitance of diode and derive expression of diffusion capacitance.
- c) What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. Explain working of voltage doubler.

## Section – II

## Q.4 Solve any four questions.

a) Design Collector to base biasing circuit for

 $V_{CEQ} = 5V, I_{CQ} = 5mA, Vcc = 12 V, \beta dc = 120.$ 

- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain DC load line concept in BJT CE amplifier.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.

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Set R

## Q.5 Solve any Two questions.

- a) Consider transistor CE amplifier with  $RL = 2.7K\Omega$ , hie =  $4.5K\Omega$ , hre =  $2 \times 10^{-4}$ , hfe =-330, hoe =  $30\mu$ °. Calculate Ai, Av, Ri, Ro, Ap.
- **b)** Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vopeak = 4V and stability factor S=10. Assume hfe = 45, hie = 1.4K $\Omega$ .
- c) Explain Common Source JFET amplifier with its basic parameters.
# S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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.

**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I** 

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

- The output voltage of common base amplifier is with input signal. 1)
  - in phase b) 270° a)
    - 90° out of phase d) 180° c)
- The total emitter current (I<sub>E</sub>) is given by \_\_\_\_ 2)
  - b)  $I_E = I_{pE} I_{nE}$ a)  $I_E = I_{pE} * I_{nE}$  $I_{\rm E} = I_{\rm pE}/I_{\rm nE}$ d)  $I_{E} = I_{nE} + I_{nE}$ C)
- 3) The correct relation between the transistor parameters  $\alpha$  and  $\beta$  are related by \_\_\_
  - a)  $\beta = 1 - \alpha / \alpha$ b)  $\beta = 1 + \alpha/\alpha$  $\alpha = \beta + 1/\beta$ d)  $\alpha = \beta/\beta + 1$ c)
- 4) The Early Effect is also called as \_\_\_\_\_
  - Base-width modulation effect a)
  - Base-width amplification effect b)
  - Punch through effect c)
  - None of the mentioned d)

#### Which of the following acts as a buffer? 5)

- CC amplifier b) CE amplifier a) c)
  - CB amplifier d) Cascaded amplifier
- 6) The ripple factor is independent of resistance in filter.
  - b) LC L
  - С d) CLC c)
- Load regulation of ideal power supply must be \_\_\_\_\_. 7)
  - Zero b) Infinite a)
  - C) Large d) None of these
- 8) PIV of rectifier diode depends upon \_\_\_\_\_
  - Maximum reverse voltage across it a)
  - Maximum forward voltage across it b)
  - Type of semiconductor material used C)
  - d) None of these

a)

c)

- Load regulation can be improved in LC filter by \_\_\_\_ 9)
  - Inductor filter a)
    - Using bleeder resistor
- b) Using capacitor filter
  - d) Using bleeder capacitor

Max. Marks: 70

Marks: 14

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### Seat No.



- 10) If one of the diode in centre tapped full wave rectifier circuit get damaged it act like
  - a) Clamper circuit

c)

- b) Half wave rectifier
- Both a & b
- d) Cant say
- 11) Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature.
  - a) Half,  $10^{\circ}$ C b) Triple, 30°C c) Double, 10°C
    - d) Constant, 10°C
- 12) The critical value of inductance in choke input filter is \_\_\_\_\_.
  - a)  $3\omega/R_L$ b)  $R_L/3\omega$ c)  $3\omega R_L$ 
    - d) R<sub>L</sub>
- 13) Which are the majority charge carriers in P-channel JFET by enhancing the flow of current between two N-regions or gates?
  - b) Electrons a) Holes
  - d) None of the above Both a & b c)
- 14) Which internally connected region is heavily doped with an impurity by forming double PN junctions in JFET?
  - Source a)
  - C) Gate

- b) Drain
- d) Channel

### Seat No.

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

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

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### Section – I

#### Q.2 Solve any four

- a) What is PIV rating of diode? What is value of PIV for centre tapped full wave rectifier explain with neat circuit diagram.
- b) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.
- c) Explain with neat circuit diagram working of voltage Tripler.

4

d) Draw output waveform and transfer characteristics for following circuit.



e) Derive expression for efficiency and ripple factor for half wave rectifier.

#### Q.3 Solve any two.

- a) Design unregulated power supply with two diode and CLC filter to provide 20V and 10mA current, ripple content in the output must be less than 1%.
- **b)** Explain depletion and diffusion capacitance of diode and derive expression of diffusion capacitance.
- c) What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. Explain working of voltage doubler.

#### Section – II

#### Q.4 Solve any four questions.

a) Design Collector to base biasing circuit for

 $V_{CEQ} = 5V, I_{CQ} = 5mA, Vcc = 12 V, \beta dc = 120.$ 

- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain DC load line concept in BJT CE amplifier.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.

16

**SLR-FM-228** 

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## Set S

#### Q.5 Solve any Two questions.

- a) Consider transistor CE amplifier with  $RL = 2.7K\Omega$ ,  $hie = 4.5K\Omega$ ,  $hre = 2 \times 10^{-4}$ , hfe = -330,  $hoe = 30\mu U$ . Calculate Ai, Av, Ri, Ro, Ap.
- **b)** Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vopeak = 4V and stability factor S=10. Assume hfe = 45, hie = 1.4K $\Omega$ .
- c) Explain Common Source JFET amplifier with its basic parameters.

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS

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.

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

- Quality factor Q of coil is defined as \_\_\_\_\_.
  - a) Q = WL/2R
  - b)  $Q = 2\prod *Max$  energy stored/energy dissipated per cycle
  - c) Q = 1/2WCR
  - d) None

**Duration: 30 Minutes** 

- A practical current source consists of \_\_\_\_\_.
  - a) An ideal current source in series with a resistance
  - b) An ideal current source in parallel with a resistance
  - c) An ideal current source in parallel with voltage source
  - d) None of the above
- In parallel resonance, resonance occurs when susceptance part of admittance is \_\_\_\_\_.
  - a) Infinite b)  $X_L > X_C$ c)  $X_C > X_L$  d) Zero
  - In series PLC circuit operating frequency below for
- 4) In series RLC circuit operating frequency below for \_\_\_\_\_
  - a) I leads Vs b) I lags behind Vs
  - c) I &Vs in phase d) None
- 5) In Series RLC circuit, at resonance the voltage across capacitor and voltage across inductance are in \_\_\_\_\_.
  - a)  $V_L > V_C$ c)  $V_L = V_C$ b)  $V_C > V_L$ d)  $V_L + V_C$
- 6) What is the driving point impedance at port one with port two open circuited for the network shown below ( $Z_a = 1\Omega$ ,  $Z_b = 3\Omega$ , &  $Z_c = 2\Omega$ )?



Seat No.



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Max. Marks: 70

- **SLR-FM-229** Set When two port networks are connected in parallel the resultant Z parameters are the sum of individual parameters a) Y parameters are the sum of individual parameters b) c) both a & b None d) If the number of zeros (n) are greater than the number of poles (m), then there will be \_\_\_\_\_ number of zeros at  $s = \infty$ . a) n b) Μ c) n-m d) n+m If V1 is the voltage at port 1 and V2 is the voltage at port 2, then the attenuation in dB is? 20 log 10 (V1/V2) b) a)  $10 \log 10 (V1/V2)$ 20 log 10 (V2/V1) d) c)  $10 \log 10 (V2/V1)$ 10) In band elimination filter, the frequency of resonance of individual arms is geometric \_ Mean of two cut-off frequencies a) Difference of two cut-off frequencies b) Product of two cut-off frequencies c) d) Division of two cut-off frequencies
- 11) Transient behavior occurs in any circuit when
  - There are sudden changes of applied voltage a)
  - The voltage source is shorted b)
  - The circuit is connected or disconnected from the supply c)
  - d) All of these

a) 1

7)

8)

9)

- A series R-L circuit with R =  $30\Omega$  and L = 15H has a constant voltage V = 12) 60V applied at t = 0. Determine the current (A) in the circuit at t = 0+.
  - b) 2
  - 3 d) 0 c)
- 13) The ratio of the current transform at one port to current transform at other port is called?
  - a) Transfer admittance
- Transfer impedance b)
- c) Current transfer ratio

- d) Voltage transfer ratio
- 14) Consider the RL circuit shown in the figure below. The input voltage  $V_s(t)$ is also shown in the figure. Let t1 = 0.1 msec.



No.			
	S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019		
	Electronics & Telecommunication Engineering		
	NETWORK THEORY & ANALYSIS		

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

 $4\Omega$ 

50Z00 V

#### Section – I

 $-i4\Omega$ 

#### Q.2 Attempt any four.

Seat

a) For the circuit shown below determine the current in  $(2+j3) \Omega$  by using superposition theorem.



j3Ω

 $2\Omega$ 

- c) Define bandwidth. Derive expression for upper cut off and lower cut off frequencies for series resonant circuit.
- d) The parameters of two port n/w are  $Z_{11} = 10\Omega$ ,  $Z_{22} = 15 \Omega$ ,  $Z_{12} = Z_{21} = 5 \Omega$ . Find the equivalent T n/w.
- e) Find h parameters for the circuit shown below.



Set P

Max. Marks: 56

20 Z900 A

#### Q.3 Attempt any two.

- a) State and verify maximum transfer theorem. A DC voltage source has open circuit voltage of 20V and internal resistance for of 2 Ω. Determine the value of the load resistance that gives maximum power dissipation.
- **b)** Show that  $\omega_{\rm r} = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 \left(\frac{L}{c}\right)}{R_C^2 \left(\frac{L}{c}\right)}}$

For circuit shown below, find the value of L at which the circuit resonates at a frequency of 1000 rda/sec.

- c) Explain reciprocity and symmetry for -
  - 1) Z parameters
  - 2) Y parameters

#### Section – II

#### Q.4 Attempt any four

- a) Design a  $\pi$  type attenuator to give 20dB attenuation and to have characteristic impedance of 100 $\Omega$ .
- b) Find Z11(S)=V1(S)/I1(S) and G21(S)=V2(S)/V1(S) for the Network shown below.





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c) In the circuit shown below, the initial charge on the capacitor is 2.5 mC, with the voltage polarity as indicated. The switch is closed at time t=0. calculate the current i(t) at a time t after the switch is closed.



- d) What is filter? What are applications of filter? Explain types of filters with its ideal attenuation characteristics.
- e) Give the definition of poles and zero of the network and significance of pole and zero of the network function.

#### Q.5 Attempt any two.

- a) Explain the classification of filter in brief. Design T section of m-derived LPF having cut off frequency of 1 Kz, Design impedance of 400Ω and the resonant frequency of 1100Hz.
- b) Show the Pole zero Plot of the given network function V(S) and hence obtain V(t).

$$I(S) = \frac{3S}{(S+2)(S^2+2S+2)}$$

c) Discuss step voltage and Step current response of R-L Circuit.

**SLR-FM-229** 

Set P

Set

Q

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS**

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.

2) Figures to the right indicate full marks.

### 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

- If the number of zeros (n) are greater than the number of poles (m), then 1) there will be \_\_\_\_\_ number of zeros at  $s = \infty$ .
  - a) n b) Μ
  - c) n-m d) n+m
- 2) If V1 is the voltage at port 1 and V2 is the voltage at port 2, then the attenuation in dB is?
  - 20 log 10 (V1/V2) b) a)  $10 \log 10 (V1/V2)$
  - 20 log 10 (V2/V1) d)  $10 \log 10 (V2/V1)$ c)
- 3) In band elimination filter, the frequency of resonance of individual arms is geometric
  - Mean of two cut-off frequencies a)
  - Difference of two cut-off frequencies b)
  - Product of two cut-off frequencies c)
  - d) Division of two cut-off frequencies
- Transient behavior occurs in any circuit when 4)
  - There are sudden changes of applied voltage a)
  - The voltage source is shorted b)
  - The circuit is connected or disconnected from the supply c)
  - d) All of these
- 5) A series R-L circuit with R =  $30\Omega$  and L = 15H has a constant voltage V = 60V applied at t = 0. Determine the current (A) in the circuit at t = 0+.
  - 1 b) 2 a)
  - 3 d) 0 C)
- 6) The ratio of the current transform at one port to current transform at other port is called?
  - a) Transfer admittance
- Transfer impedance b)
- c) Current transfer ratio
- d) Voltage transfer ratio

Max. Marks: 70



- 10)
- 11)
- 12)
  - $V_C > V_L$ a)  $V_L > V_C$ b)  $V_{l} + V_{C}$
  - c)  $VL = V_C$ d)
- What is the driving point impedance at port one with port two open 13) circuited for the network shown below ( $Z_a = 1\Omega$ ,  $Z_b = 3\Omega$ , &  $Z_c = 2\Omega$ )?



- 14) When two port networks are connected in parallel the resultant \_\_\_\_\_
  - Z parameters are the sum of individual parameters a)
  - Y parameters are the sum of individual parameters b)
  - both a & b C)
  - d) None

4Ω

5Ω

a)

C)

7)

8)

9)

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS

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

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

 $4\Omega$ 

50%0° V

#### Section – I

 $-i4\Omega$ 

#### Q.2 Attempt any four.

a) For the circuit shown below determine the current in  $(2+j3) \Omega$  by using superposition theorem.

b) Derive expression for resonant frequency in series RLC circuit. How the value of R will affect on frequency response.

j3Ω

 $2\Omega$ 

- c) Define bandwidth. Derive expression for upper cut off and lower cut off frequencies for series resonant circuit.
- d) The parameters of two port n/w are  $Z_{11} = 10\Omega$ ,  $Z_{22} = 15 \Omega$ ,  $Z_{12} = Z_{21} = 5 \Omega$ . Find the equivalent T n/w.
- e) Find h parameters for the circuit shown below.





20 Z900 A

Set

Max. Marks: 56



#### Q.3 Attempt any two.

- a) State and verify maximum transfer theorem. A DC voltage source has open circuit voltage of 20V and internal resistance for of 2  $\Omega$ . Determine the value of the load resistance that gives maximum power dissipation.
- **b)** Show that  $\omega_{r} = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_{L}^{2} \left(\frac{L}{c}\right)}{R_{C}^{2} \left(\frac{L}{c}\right)}}$

For circuit shown below, find the value of L at which the circuit resonates at a frequency of 1000 rda/sec.

- $10 \Omega$  -j12  $5 \Omega$  LV
- c) Explain reciprocity and symmetry for -
  - 1) Z parameters
  - 2) Y parameters

#### Section – II

#### Q.4 Attempt any four

- a) Design a  $\pi$  type attenuator to give 20dB attenuation and to have characteristic impedance of 100 $\Omega$ .
- b) Find Z11(S)=V1(S)/I1(S) and G21(S)=V2(S)/V1(S) for the Network shown below.





12

c) In the circuit shown below, the initial charge on the capacitor is 2.5 mC, with the voltage polarity as indicated. The switch is closed at time t=0. calculate the current i(t) at a time t after the switch is closed.



- d) What is filter? What are applications of filter? Explain types of filters with its ideal attenuation characteristics.
- e) Give the definition of poles and zero of the network and significance of pole and zero of the network function.

#### Q.5 Attempt any two.

- a) Explain the classification of filter in brief. Design T section of m-derived LPF having cut off frequency of 1 Kz, Design impedance of 400Ω and the resonant frequency of 1100Hz.
- b) Show the Pole zero Plot of the given network function V(S) and hence obtain V(t).

$$I(S) = \frac{3S}{(S+2)(S^2+2S+2)}$$

c) Discuss step voltage and Step current response of R-L Circuit.

**SLR-FM-229** 

Set Q

Set

R

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS

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.

2) Figures to the right indicate full marks.

### 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

1) In Series RLC circuit, at resonance the voltage across capacitor and voltage across inductance are in \_\_\_\_\_.

a)	$V_L > V_C$	b)	$V_C > V_L$
C)	$VL = V_C$	d)	$V_L + V_C$

2) What is the driving point impedance at port one with port two open circuited for the network shown below ( $Z_a = 1\Omega$ ,  $Z_b = 3\Omega$ , &  $Z_c = 2\Omega$ )?



- 3) When two port networks are connected in parallel the resultant \_\_\_\_\_.
  - a) Z parameters are the sum of individual parameters
  - b) Y parameters are the sum of individual parameters
  - c) both a & b
  - d) None

a) 4Ω

c) 5Ω

4) If the number of zeros (n) are greater than the number of poles (m), then there will be \_\_\_\_\_ number of zeros at  $s = \infty$ .

a)	n	b)	Μ

- c) n-m d) n+m
- 5) If V1 is the voltage at port 1 and V2 is the voltage at port 2, then the attenuation in dB is?
  - a) 20 log 10 (V1/V2) b) 10 log 10 (V1/V2)
  - c) 20 log 10 (V2/V1) d) 10 log 10 (V2/V1)
- In band elimination filter, the frequency of resonance of individual arms is geometric \_\_\_\_\_.
  - a) Mean of two cut-off frequencies
  - b) Difference of two cut-off frequencies
  - c) Product of two cut-off frequencies
  - d) Division of two cut-off frequencies



Transient behavior occurs in any circuit when \_\_\_\_\_

- a) There are sudden changes of applied voltage
- b) The voltage source is shorted
- c) The circuit is connected or disconnected from the supply
- d) All of these
- 8) A series R-L circuit with R =  $30\Omega$  and L = 15H has a constant voltage V = 60V applied at t = 0. Determine the current (A) in the circuit at t = 0+.
  - a) 1 b) 2
  - c) 3 d) 0
- 9) The ratio of the current transform at one port to current transform at other port is called?
  - a) Transfer admittance
- b) Transfer impedance

**SLR-FM-229** 

Set

- c) Current transfer ratio
- d) Voltage transfer ratio
- 10) Consider the RL circuit shown in the figure below. The input voltage  $V_s(t)$  is also shown in the figure. Let t1 = 0.1 msec. What is i(0-)?



- 11) Quality factor Q of coil is defined as \_\_\_\_
  - a) Q = WL/2R
  - b)  $Q = 2\prod *Max$  energy stored/energy dissipated per cycle
  - c) Q = 1/2WCR
  - d) None
- 12) A practical current source consists of \_\_\_\_\_.
  - a) An ideal current source in series with a resistance
  - b) An ideal current source in parallel with a resistance
  - c) An ideal current source in parallel with voltage source
  - d) None of the above
- In parallel resonance, resonance occurs when susceptance part of admittance is \_\_\_\_\_.
  - a) Infinite b) X<sub>L</sub>>X<sub>C</sub>
  - c)  $X_C>X_L$  d) Zero
- 14) In series RLC circuit operating frequency below for \_\_\_\_\_
  - a) I leads Vs
- b) I lags behind Vs
- c) I &Vs in phase d) None

Seat <u>No.</u> S.E. (Part – I) (New/Old) (CBCS

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS

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

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

 $4\Omega$ 

50%0° V

#### Section – I

 $-i4\Omega$ 

#### Q.2 Attempt any four.

a) For the circuit shown below determine the current in  $(2+j3) \Omega$  by using superposition theorem.



j3Ω

 $2\Omega$ 

- c) Define bandwidth. Derive expression for upper cut off and lower cut off frequencies for series resonant circuit.
- d) The parameters of two port n/w are  $Z_{11} = 10\Omega$ ,  $Z_{22} = 15 \Omega$ ,  $Z_{12} = Z_{21} = 5 \Omega$ . Find the equivalent T n/w.
- e) Find h parameters for the circuit shown below.





Max. Marks: 56

20 Z900 A

#### Q.3 Attempt any two.

- a) State and verify maximum transfer theorem. A DC voltage source has open circuit voltage of 20V and internal resistance for of 2  $\Omega$ . Determine the value of the load resistance that gives maximum power dissipation.
- **b)** Show that  $\omega_{\rm r} = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 \left(\frac{L}{c}\right)}{R_C^2 \left(\frac{L}{c}\right)}}$

For circuit shown below, find the value of L at which the circuit resonates at a frequency of 1000 rda/sec.

- c) Explain reciprocity and symmetry for -
  - 1) Z parameters
  - 2) Y parameters

#### Section – II

#### Q.4 Attempt any four

- a) Design a  $\pi$  type attenuator to give 20dB attenuation and to have characteristic impedance of 100 $\Omega$ .
- b) Find Z11(S)=V1(S)/I1(S) and G21(S)=V2(S)/V1(S) for the Network shown below.





c) In the circuit shown below, the initial charge on the capacitor is 2.5 mC, with the voltage polarity as indicated. The switch is closed at time t=0. calculate the current i(t) at a time t after the switch is closed.



- d) What is filter? What are applications of filter? Explain types of filters with its ideal attenuation characteristics.
- e) Give the definition of poles and zero of the network and significance of pole and zero of the network function.

#### Q.5 Attempt any two.

- a) Explain the classification of filter in brief. Design T section of m-derived LPF having cut off frequency of 1 Kz, Design impedance of  $400\Omega$  and the resonant frequency of 1100Hz.
- b) Show the Pole zero Plot of the given network function V(S) and hence obtain V(t).

$$I(S) = \frac{3S}{(S+2)(S^2+2S+2)}$$

c) Discuss step voltage and Step current response of R-L Circuit.

**SLR-FM-229** 

Set R

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS**

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.

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### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Marks: 14

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

- 1) In band elimination filter, the frequency of resonance of individual arms is geometric
  - Mean of two cut-off frequencies a)
  - Difference of two cut-off frequencies b)
  - Product of two cut-off frequencies C)
  - d) Division of two cut-off frequencies
- 2) Transient behavior occurs in any circuit when
  - There are sudden changes of applied voltage a)
  - The voltage source is shorted b)
  - c) The circuit is connected or disconnected from the supply
  - d) All of these
- 3) A series R-L circuit with R =  $30\Omega$  and L = 15H has a constant voltage V = 60V applied at t = 0. Determine the current (A) in the circuit at t = 0+.
  - a) 1 2 b)
  - c) 3 d) 0
- 4) The ratio of the current transform at one port to current transform at other port is called?
  - a) Transfer admittance Transfer impedance b)
  - Current transfer ratio d) Voltage transfer ratio c)

5) Consider the RL circuit shown in the figure below. The input voltage  $V_s(t)$ is also shown in the figure. Let t1 = 0.1 msec. What is i(0-)?



Seat No.



Max. Marks: 70



- a) 4Ω b) c) 5Ω 2Ω d)
- 12) When two port networks are connected in parallel the resultant \_\_\_\_\_

3Ω

- a) Z parameters are the sum of individual parameters
- b) Y parameters are the sum of individual parameters
- c) both a & b
- d) None
- If the number of zeros (n) are greater than the number of poles (m), then 13) there will be number of zeros at  $s = \infty$ .
  - a) n b) Μ d) C) n-m n+m
- 14) If V1 is the voltage at port 1 and V2 is the voltage at port 2, then the attenuation in dB is?
  - a)  $20 \log 10 (V1/V2)$ b) 10 log 10 (V1/V2)
  - c)  $20 \log 10 (V2/V1)$ d) 10 log 10 (V2/V1)

Seat	
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### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering NETWORK THEORY & ANALYSIS

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 $4\Omega$ 

#### Section – I

 $-i4\Omega$ 

#### Q.2 Attempt any four.

a) For the circuit shown below determine the current in  $(2+j3) \Omega$  by using superposition theorem.



 $2\Omega$ 

- **b)** Derive expression for resonant frequency in series RLC circuit. How the value of R will affect on frequency response.
- c) Define bandwidth. Derive expression for upper cut off and lower cut off frequencies for series resonant circuit.
- d) The parameters of two port n/w are  $Z_{11}$  =10 $\Omega$ ,  $Z_{22}$  = 15  $\Omega$ ,  $Z_{12}$  =  $Z_{21}$  = 5  $\Omega$ . Find the equivalent T n/w.
- e) Find h parameters for the circuit shown below.



Max. Marks: 56

Set

S

#### Q.3 Attempt any two.

- a) State and verify maximum transfer theorem. A DC voltage source has open circuit voltage of 20V and internal resistance for of 2  $\Omega$ . Determine the value of the load resistance that gives maximum power dissipation.
- **b)** Show that  $\omega_{\rm r} = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 \left(\frac{L}{c}\right)}{R_C^2 \left(\frac{L}{c}\right)}}$

For circuit shown below, find the value of L at which the circuit resonates at a frequency of 1000 rda/sec.

- c) Explain reciprocity and symmetry for -
  - 1) Z parameters
  - 2) Y parameters

#### Section – II

#### Q.4 Attempt any four

- a) Design a  $\pi$  type attenuator to give 20dB attenuation and to have characteristic impedance of 100 $\Omega$ .
- b) Find Z11(S)=V1(S)/I1(S) and G21(S)=V2(S)/V1(S) for the Network shown below.





c) In the circuit shown below, the initial charge on the capacitor is 2.5 mC, with the voltage polarity as indicated. The switch is closed at time t=0. calculate the current i(t) at a time t after the switch is closed.



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Set S

12

- d) What is filter? What are applications of filter? Explain types of filters with its ideal attenuation characteristics.
- e) Give the definition of poles and zero of the network and significance of pole and zero of the network function.

#### Q.5 Attempt any two.

- a) Explain the classification of filter in brief. Design T section of m-derived LPF having cut off frequency of 1 Kz, Design impedance of  $400\Omega$  and the resonant frequency of 1100Hz.
- b) Show the Pole zero Plot of the given network function V(S) and hence obtain V(t).

$$I(S) = \frac{3S}{(S+2)(S^2+2S+2)}$$

c) Discuss step voltage and Step current response of R-L Circuit.

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### Seat No.

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering DIGITAL TECHNIQUES**

Day & Date: Saturday, 14-12-2019 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.
- 4) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

2)

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

- In a four variable K-map eight adjacent cells give \_\_\_\_ 1)
  - a) Single variable term
  - c) Three variable term
  - In a 4 bit full adder how many half adders and OR gates are required?
  - a) 8 and 4 b)
  - c) 7 and 3 d)
- Consider the following statements for a multiplexer \_\_\_\_ 3)
  - selects one of the several inputs and steers it to the output i)
  - routes the data from a single input to many outputs ii)
  - converts parallel data into serial data iii)
  - is a combinational circuit iv)

Which of the above is correct for a Multiplexer?

- a) i, ii, iii i, iii, iv b)
- c) i, ii, iv ii, iii, iv d)
- 4) Consider the following statements.
  - ECL has least propagation delay i)
  - TTL has largest fan out ii)
  - CMOS has highest noise margin iii)
  - TTL has lowest power dissipation iv)

Which of the following are correct for above statements?

- a) i&iii ii & iv b) c) iii & iv d) i&ii
- 5) A JK flip flop can be converted to D flip flop by, .
  - a) Connecting both J and K terminals to D
  - b) Connecting J terminal to D and leaving K open
  - c) Connecting K terminal to D and leaving J open
  - d) Connecting J terminal to D and K terminal to D through an inverter
- How many NAND gates are used to construct Active High S-R flip flop? 6)
  - a) 5 b) 3
  - 8 c) 4 d)

Max. Marks: 70

Set

Ρ

Marks: 14

- b) Two variable term
- Four variable term d)

  - 7 and 4
  - 8 and 3

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			Set P
7)	In comparison with Serial adder the a) is slower c) is faster	Para b) d)	llel adder has same speed has delayed output
8)	Maximum MOD number for a 2-bit b a) 4 c) 8	inary b) d)	counter is 3 16
9)	To serially shift a 5-bit of data into a a) 1 clock pulse c) 5 clock pulses	shift b) d)	register, there must be 4 clock pulses 1 clock pulse for each 1
10)	<ul> <li>To operate correctly, starting a ring of</li> <li>a) presetting all the flip-flops</li> <li>b) clearing all the flip-flops</li> <li>c) presetting one flip-flop and clear</li> <li>d) none of the above</li> </ul>	count ring a	er requires Il the others
11)	How many minimum number of flip-f binary counter? a) 32 c) 5	lops b) d)	are required to make a MOD-28 16 4
12)	When two counters are cascaded, th the of their individual MOD nu a) Product c) Log	ne ov umbe b) d)	erall MOD number is equal to rs. Sum Reciprocal
13)	<ul> <li>Clock signals are used in sequential</li> <li>a) To tell current time</li> <li>b) To tell how propagation delay</li> <li>c) To carry serial data signals</li> <li>d) To synchronize events in variou</li> </ul>	logic s par	circuits ts of the system
14)	How many flip-flops are in the IC749	)5? b)	2

a) 1 b) 2 c) 3 d) 4

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#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 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 diagrams.
- 4) Assume suitable data if necessary.

#### Section – I

#### Q.2 Answer any four.

Seat

No.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

#### Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
  - 4) Figure of Merit (Speed Power Product)

#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

#### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

12

16

12

### Set S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Saturday, 14-12-2019 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.

**DIGITAL TECHNIQUES** 

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams.
- 4) Assume suitable 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

- Maximum MOD number for a 2-bit binary counter is . 1)
  - a) 4 b) 3
  - d) 16 c) 8
- 2) To serially shift a 5-bit of data into a shift register, there must be \_\_\_\_\_.
  - 1 clock pulse a)
  - 5 clock pulses 1 clock pulse for each 1 d) c)
- To operate correctly, starting a ring counter requires \_\_\_\_\_. 3)
  - a) presetting all the flip-flops
  - b) clearing all the flip-flops
  - c) presetting one flip-flop and clearing all the others
  - d) none of the above
- 4) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
  - a) 32 b) 16 4
  - c) 5 d)
- When two counters are cascaded, the overall MOD number is equal to 5) the of their individual MOD numbers.
  - a) Product Sum b) c) Log d) Reciprocal
- 6) Clock signals are used in sequential logic circuits \_\_\_\_\_.
  - a) To tell current time
  - b) To tell how propagation delay
  - c) To carry serial data signals
  - d) To synchronize events in various parts of the system
- How many flip-flops are in the IC7495? 7)
  - a) 1 2 b) c) 3 d) 4
- 8) In a four variable K-map eight adjacent cells give \_\_\_\_
  - a) Single variable term Two variable term b)
  - c) Three variable term d) Four variable term

**SLR-FM-230** 



Max. Marks: 70

Marks: 14

- 4 clock pulses b)

- Set Q
- 9) In a 4 bit full adder how many half adders and OR gates are required?
  - a) 8 and 4
- b) 7 and 4
- c) 7 and 3 d) 8 and 3

10) Consider the following statements for a multiplexer \_\_\_\_\_.

- i) selects one of the several inputs and steers it to the output
- ii) routes the data from a single input to many outputs
- iii) converts parallel data into serial data
- iv) is a combinational circuit

Which of the above is correct for a Multiplexer?

- a) i, ii, iii b) i, iii, iv
- c) i, ii, iv d) ii, iii, iv
- 11) Consider the following statements.
  - i) ECL has least propagation delay
  - ii) TTL has largest fan out
  - iii) CMOS has highest noise margin
  - iv) TTL has lowest power dissipation

Which of the following are correct for above statements?

- a) i & iii b) ii & iv
- c) iii & iv d) i & ii
- 12) A JK flip flop can be converted to D flip flop by, \_\_\_\_\_.
  - a) Connecting both J and K terminals to D
  - b) Connecting J terminal to D and leaving K open
  - c) Connecting K terminal to D and leaving J open
  - d) Connecting J terminal to D and K terminal to D through an inverter

13) How many NAND gates are used to construct Active High S-R flip flop?

- a) 5 b) 3 c) 4 d) 8
  - d) 8
- 14) In comparison with Serial adder the Parallel adder \_\_\_\_\_.
  - a) is slowerc) is faster

- b) has same speed
- d) h
  - d) has delayed output

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

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#### Section – I

#### Q.2 Answer any four.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

#### Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
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#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

#### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

Q

16

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Seat No.

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No.	

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 01:00 PM

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### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

1)

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

- A JK flip flop can be converted to D flip flop by, \_\_\_\_\_.
  - a) Connecting both J and K terminals to D
  - b) Connecting J terminal to D and leaving K open
  - c) Connecting K terminal to D and leaving J open
  - d) Connecting J terminal to D and K terminal to D through an inverter
- 2) How many NAND gates are used to construct Active High S-R flip flop?
  - a) 5 b) 3
  - c) 4 d) 8
- 3) In comparison with Serial adder the Parallel adder \_\_\_\_\_.
  - a) is slowerb) has same speedc) is fasterd) has delayed output
    - is faster d) has delayed output
- 4) Maximum MOD number for a 2-bit binary counter is \_\_\_\_\_.
  - a) 4 b) 3
  - c) 8 d) 16
- 5) To serially shift a 5-bit of data into a shift register, there must be \_\_\_\_\_.
  - a) 1 clock pulse b) 4 clock pulses
  - c) 5 clock pulses d) 1 clock pulse for each 1
- 6) To operate correctly, starting a ring counter requires \_\_\_\_\_.
  - a) presetting all the flip-flops
  - b) clearing all the flip-flops
  - c) presetting one flip-flop and clearing all the others
  - d) none of the above
- 7) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
  - a) 32 b) 16 c) 5 d) 4
- 8) When two counters are cascaded, the overall MOD number is equal to the \_\_\_\_\_ of their individual MOD numbers.
  - a) Product b) Sum
  - c) Log d) Reciprocal

Set R

Max. Marks: 70

Marks: 14

9) Clock signals are used in sequential logic circuits \_\_\_\_\_.

- a) To tell current time
- b) To tell how propagation delay
- c) To carry serial data signals
- d) To synchronize events in various parts of the system

#### 10) How many flip-flops are in the IC7495?

- a) 1 b) 2
- c) 3 d) 4
- 11) In a four variable K-map eight adjacent cells give \_\_\_\_\_
  - a) Single variable term b) Two variable term
  - c) Three variable term d) Four variable term
- 12) In a 4 bit full adder how many half adders and OR gates are required?
  - a) 8 and 4 b) 7 and 4
  - c) 7 and 3 d) 8 and 3
- 13) Consider the following statements for a multiplexer \_\_\_\_
  - i) selects one of the several inputs and steers it to the output
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Which of the following are correct for above statements?

- a) i & iii b) ii & iv
- c) iii & iv d) i & ii

**SLR-FM-230** 

Set R

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R

16

### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

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#### Section – I

#### Q.2 Answer any four.

Seat

No.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
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- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
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#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
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- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

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- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
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Max. Marks: 56

16

12

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### No. S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019

Day & Date: Saturday, 14-12-2019 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.

**Electronics & Telecommunication Engineering DIGITAL TECHNIQUES** 

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams.
- 4) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

3)

Seat

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

- To operate correctly, starting a ring counter requires \_\_\_\_\_. 1)
  - a) presetting all the flip-flops
  - b) clearing all the flip-flops
  - c) presetting one flip-flop and clearing all the others
  - d) none of the above
- 2) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
  - a) 32 16 b) d) c) 5 4
  - When two counters are cascaded, the overall MOD number is equal to
    - the \_\_\_\_\_ of their individual MOD numbers.
    - a) Product b) Sum
    - d) Reciprocal c) Log
- Clock signals are used in sequential logic circuits \_\_\_\_\_. 4)
  - a) To tell current time
  - b) To tell how propagation delay
  - c) To carry serial data signals
  - d) To synchronize events in various parts of the system
- 5) How many flip-flops are in the IC7495?
  - a) 1 2 b)
  - c) 3 d) 4
- 6) In a four variable K-map eight adjacent cells give \_\_\_\_\_.
  - Two variable term Single variable term b) a) d) Four variable term
  - c) Three variable term
- In a 4 bit full adder how many half adders and OR gates are required? 7)
  - a) 8 and 4 7 and 4 b)
  - c) 7 and 3 d) 8 and 3

Max. Marks: 70

Marks: 14

#### Set 8) Consider the following statements for a multiplexer selects one of the several inputs and steers it to the output i) routes the data from a single input to many outputs ii) converts parallel data into serial data iii) is a combinational circuit iv) Which of the above is correct for a Multiplexer? a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii. iii. iv 9) Consider the following statements. ECL has least propagation delay i) ii) TTL has largest fan out CMOS has highest noise margin iii) TTL has lowest power dissipation iv) Which of the following are correct for above statements? a) i&iii b) ii & iv c) iii & iv d) i&ii A JK flip flop can be converted to D flip flop by, \_\_\_\_\_. 10) a) Connecting both J and K terminals to D b) Connecting J terminal to D and leaving K open c) Connecting K terminal to D and leaving J open d) Connecting J terminal to D and K terminal to D through an inverter How many NAND gates are used to construct Active High S-R flip flop? 11) a) 5 b) 3 c) 4 d) 8 In comparison with Serial adder the Parallel adder \_\_\_\_\_. 12) a) is slower b) has same speed c) is faster d) has delayed output 13) Maximum MOD number for a 2-bit binary counter is \_\_\_\_\_. a) 4 b) 3 c) 8 d) 16 To serially shift a 5-bit of data into a shift register, there must be \_\_\_\_\_. 14) 1 clock pulse a) b)

- c)
- 4 clock pulses
- 5 clock pulses d) 1 clock pulse for each 1

**SLR-FM-230** 

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 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 diagrams.
- 4) Assume suitable data if necessary.

#### Section – I

#### Q.2 Answer any four.

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- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

#### Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
  - 4) Figure of Merit (Speed Power Product)

#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

#### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

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#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ANALOG COMMUNICATION Max. Marks: 70

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 minute in answer book.

- 2) All questions are compulsory.
- 3) Figures to the right indicate full marks.

#### **MCQ/Objective Type Questions**

- **Duration: 30 Minutes** Q1 Choose the correct option alternatives from the options.
  - Modulation is done in . 1)
    - Transmitter a)
      - b) Radio receiver
      - Between transmitter and radio receiver c)
      - None of the above d)
  - 2) Superhertodyne principle refers to \_\_\_\_\_.
    - Using a large number of amplifier stages a)
    - Using a push-pull circuit b)
    - Obtaining lower fixed intermediate frequency c)
    - None of the above d)
  - 3) The IF is 455 kHz. If the radio receiver is tuned to 855 kHz, the local oscillator frequency is \_\_\_\_\_.
    - 455KHz b) 1310KHz a) C)
      - 1500KHz d) 1520KHz
  - In an AM wave, the majority of the power is in 4)
    - a) Lower Sideband b) Upper sideband Carrier
    - c)
  - Low frequency noise is \_\_\_\_\_. 5)
    - Shot Nosie a)
    - c) Flicker Nosie

6) Nosie figure of an amplifier is always \_

- a) Less than one
- c) Equal to one
- 7) An AM broadcast transmitter has a carrier power of 50KW. with 80% modulation, total power that would be produced will be \_\_\_\_\_.
  - 40 KW b) 50 KW a)
  - c) 66 KW d) 100 KW
- The amount of frequency deviation in FM signal depends on \_\_\_\_\_. 8)
  - a) Amplitude of the modulating signal
  - Carrier frequency b)
  - Modulating frequency c)
  - Transmitter amplifier d)

None of above d)

#### b) Thermal Nosie

- d) None of above
- b) Greater than one
- d) Equal to 100

SLR-FM-231

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Marks: 14

14

Seat No.

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- 9) Pre emphasis is done \_\_\_\_\_.
  - a) For boosting of modulating signal voltage
  - b) For modulating signals at higher frequencies
  - c) In FM before modulation
  - d) All of the above
- 10) Which mode of propagation is adopted in HF antennas?
  - a) lonosphere b) Ground wave
  - c) Tropospheric d) All of the above
- 11) The Nquist sample rate for a maximum analog information frequency of 4 Khz is \_\_\_\_\_.
  - a) 2KHz

- b) 4KHz
- c) 8KHz d) 16KHz
- 12) Radiation pattern of half wave dipole antenna is \_\_\_\_
  - a) Omni-directional
  - c) Pattern of Eight
- b) Uni-directionald) None
- 13) What is the maximum modulating frequency allowed in FM broadcastings?
  - a) 40 KHz b) 75 KHz
  - c) 15 KHz d) 120 KHz
- 14) Indirect Method of FM generation is \_\_\_\_\_
  - a) Reactance modulator
- b) Varactor diode modulator
- c) Transistorized modulator
- d) Armstrong modulator

### Seat No.

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any four of the following.

- a) Explain the characteristics of AM receiver.
- **b)** Draw the schematic diagram of VSB modulator and explain.
- c) Explain different transmission media used in the communication system.
- d) Write a note on filter method of SSB generation.
- e) The antenna current of an AM transmitter is 8 A, if only the carrier is sent, but it increases to 8.93 A, if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

#### Q.3 Solve any two of the following.

- a) Derive the expression for the total power in the modulated wave and show that 33.33% of the total power is used for information transmission.
- **b)** Derive an expression for Nosie equivalent resistance due to cascading of many amplifier.
- c) Draw and explain super heterodyne receiver. What are its advantages and disadvantages over TRF receiver?

#### Section – II

#### Q.4 Solve any four of the following.

- a) Compare sky-wave and space-wave propagation.
- **b)** What is pre-emphasis? Why is it used? Sketch a typical pre-emphasis circuit and explain why de-emphasis must be used also.
- c) Define Nyquist rate and Nyquist interval.
- d) Explain pulse amplitude modulation method.
- e) What is ground wave propagation? What are its limitation?

#### Q.5 Solve any two of the following.

- a) With block diagram, explain the working of the Armstrong method of FM generation.
- **b)** Write a short note on.
  - 1) Half dipole antenna
  - 2) Yagi uda antenna
- c) Draw a neat diagram of foster seeley discriminator and explain the working in brief with the help of voltage phasor diagram.

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**SLR-FM-231** 

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Max. Marks: 56

12

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#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ANALOG COMMUNICATION

Day & Date: Tuesday, 17-12-2019 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 minute in answer book.

- 2) All questions are compulsory.
- 3) Figures to the right indicate full marks.

#### **MCQ/Objective Type Questions**

Q1 Choose the correct option alternatives from the options.

- The amount of frequency deviation in FM signal depends on \_\_\_\_\_. 1)
  - Amplitude of the modulating signal a)
    - **Carrier frequency** b)
    - Modulating frequency c)
    - Transmitter amplifier d)
- 2) Pre emphasis is done .
  - For boosting of modulating signal voltage a)
  - b) For modulating signals at higher frequencies
  - In FM before modulation c)
  - d) All of the above
- 3) Which mode of propagation is adopted in HF antennas?
  - b) Ground wave a) lonosphere
  - Tropospheric d) All of the above c)
- The Nguist sample rate for a maximum analog information frequency of 4 4) Khz is
  - a) 2KHz b) 4KHz
  - d) 16KHz 8KHz c)
- 5) Radiation pattern of half wave dipole antenna is .
  - b) Uni-directional
  - c) Pattern of Eight d) None

What is the maximum modulating frequency allowed in FM broadcastings? 6)

- a) 40 KHz b) 75 KHz
- 15 KHz d) 120 KHz c)
- 7) Indirect Method of FM generation is
  - a) Reactance modulator Transistorized modulator C)
- b) Varactor diode modulator d) Armstrong modulator
- Modulation is done in\_\_\_\_\_. 8)

a) Omni-directional

- Transmitter a)
- b) Radio receiver
- Between transmitter and radio receiver c)
- None of the above d)



Max. Marks: 70

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- 9) Superhertodyne principle refers to \_\_\_\_\_.
  - a) Using a large number of amplifier stages
  - b) Using a push-pull circuit
  - c) Obtaining lower fixed intermediate frequency
  - d) None of the above
- 10) The IF is 455 kHz. If the radio receiver is tuned to 855 kHz, the local oscillator frequency is \_\_\_\_\_.
  - a) 455KHz

- b) 1310KHz
- c) 1500KHz d) 1520KHz
- 11) In an AM wave, the majority of the power is in \_\_\_\_\_
  - a) Lower Sideband
    - c) Carrier d) N
- b) Upper sidebandd) None of above
- 12) Low frequency noise is \_\_\_\_\_.
  - a) Shot Nosie
  - c) Flicker Nosie
- b) Thermal Nosie
- d) None of above
- 13) Nosie figure of an amplifier is always
   a) Less than one
  - b) Greater than one
  - c) Equal to one
- d) Equal to 100
- 14) An AM broadcast transmitter has a carrier power of 50KW. with 80% modulation, total power that would be produced will be \_\_\_\_\_.
  - a) 40 KW
  - c) 66 KW

- b) 50 KW
- d) 100 KW

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any four of the following.

- a) Explain the characteristics of AM receiver.
- **b)** Draw the schematic diagram of VSB modulator and explain.
- c) Explain different transmission media used in the communication system.
- d) Write a note on filter method of SSB generation.
- e) The antenna current of an AM transmitter is 8 A, if only the carrier is sent, but it increases to 8.93 A, if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

#### Q.3 Solve any two of the following.

- a) Derive the expression for the total power in the modulated wave and show that 33.33% of the total power is used for information transmission.
- **b)** Derive an expression for Nosie equivalent resistance due to cascading of many amplifier.
- c) Draw and explain super heterodyne receiver. What are its advantages and disadvantages over TRF receiver?

#### Section – II

#### Q.4 Solve any four of the following.

- a) Compare sky-wave and space-wave propagation.
- **b)** What is pre-emphasis? Why is it used? Sketch a typical pre-emphasis circuit and explain why de-emphasis must be used also.
- c) Define Nyquist rate and Nyquist interval.
- d) Explain pulse amplitude modulation method.
- e) What is ground wave propagation? What are its limitation?

#### Q.5 Solve any two of the following.

- a) With block diagram, explain the working of the Armstrong method of FM generation.
- b) Write a short note on.
  - 1) Half dipole antenna
  - 2) Yagi uda antenna
- c) Draw a neat diagram of foster seeley discriminator and explain the working in brief with the help of voltage phasor diagram.

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Max. Marks: 56

12

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Day Time	& Dat e: 10:0	e: Tuesday, 17-12-2019 00 AM To 01:00 PM	Max. Marks: 70
Inst	ructio	<b>ns:</b> 1) Q. No.1 is compulsory and should book.	be solved in first 30 minute in answer
		<ol> <li>All questions are compulsory.</li> <li>Figures to the right indicate full ma</li> </ol>	rks.
		MCQ/Objective Type C	Questions
Dura	ation: 3	30 Minutes	Marks: 14
Q1	Cho	ose the correct option alternatives from	the options. 14
	1)	a) Shot Nosie b) c) Flicker Nosie d)	Thermal Nosie None of above
	2)	Nosie figure of an amplifier is always a) Less than one b) c) Equal to one d)	 Greater than one Equal to 100
	3)	An AM broadcast transmitter has a carrier modulation, total power that would be pro- a) 40 KW b) c) 66 KW d)	r power of 50KW. with 80% oduced will be 50 KW 100 KW
	4)	<ul> <li>The amount of frequency deviation in FM</li> <li>a) Amplitude of the modulating signal</li> <li>b) Carrier frequency</li> <li>c) Modulating frequency</li> <li>d) Transmitter amplifier</li> </ul>	signal depends on
	5)	<ul> <li>Pre emphasis is done</li> <li>a) For boosting of modulating signal vo</li> <li>b) For modulating signals at higher free</li> <li>c) In FM before modulation</li> <li>d) All of the above</li> </ul>	Itage quencies
	6)	Which mode of propagation is adopted in a) lonosphereb)c) Troposphericd)	HF antennas? Ground wave All of the above
	7)	The Nquist sample rate for a maximum a Khz is a) 2KHz b) c) 8KHz d)	nalog information frequency of 4 4KHz 16KHz
	8)	Radiation pattern of half wave dipole antea)Omni-directionalb)c)Pattern of Eightd)	enna is Uni-directional None
	9)	What is the maximum modulating frequer a) 40 KHz b)	ncy allowed in FM broadcastings? 75 KHz

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ANALOG COMMUNICATION

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- d) 120 KHz c) 15 KHz

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- 10) Indirect Method of FM generation is \_\_\_\_
  - a) Reactance modulator
  - c) Transistorized modulator
- b) Varactor diode modulator
- d) Armstrong modulator
- 11) Modulation is done in\_\_\_\_\_.
  - a) Transmitter
  - b) Radio receiver
  - c) Between transmitter and radio receiver
  - d) None of the above
- 12) Superhertodyne principle refers to \_\_\_\_
  - a) Using a large number of amplifier stages
  - b) Using a push-pull circuit
  - c) Obtaining lower fixed intermediate frequency
  - d) None of the above
- 13) The IF is 455 kHz. If the radio receiver is tuned to 855 kHz, the local oscillator frequency is \_\_\_\_\_.
  - a) 455KHz
- b) 1310KHz
- c) 1500KHz d) 1520KHz
- 14) In an AM wave, the majority of the power is in
  - a) Lower Sideband
- b) Upper sideband

c) Carrier

d) None of above

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#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any four of the following.

- a) Explain the characteristics of AM receiver.
- **b)** Draw the schematic diagram of VSB modulator and explain.
- c) Explain different transmission media used in the communication system.
- d) Write a note on filter method of SSB generation.
- e) The antenna current of an AM transmitter is 8 A, if only the carrier is sent, but it increases to 8.93 A, if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

#### Q.3 Solve any two of the following.

- a) Derive the expression for the total power in the modulated wave and show that 33.33% of the total power is used for information transmission.
- **b)** Derive an expression for Nosie equivalent resistance due to cascading of many amplifier.
- c) Draw and explain super heterodyne receiver. What are its advantages and disadvantages over TRF receiver?

#### Section – II

#### Q.4 Solve any four of the following.

- a) Compare sky-wave and space-wave propagation.
- **b)** What is pre-emphasis? Why is it used? Sketch a typical pre-emphasis circuit and explain why de-emphasis must be used also.
- c) Define Nyquist rate and Nyquist interval.
- d) Explain pulse amplitude modulation method.
- e) What is ground wave propagation? What are its limitation?

#### Q.5 Solve any two of the following.

- a) With block diagram, explain the working of the Armstrong method of FM generation.
- b) Write a short note on.
  - 1) Half dipole antenna
  - 2) Yagi uda antenna
- c) Draw a neat diagram of foster seeley discriminator and explain the working in brief with the help of voltage phasor diagram.

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Max. Marks: 56

12

16

12

#### 3) Figures to the right indicate full marks. **MCQ/Objective Type Questions Duration: 30 Minutes** Choose the correct option alternatives from the options. Which mode of propagation is adopted in HF antennas? 1) lonosphere b) Ground wave a) Tropospheric d) All of the above C) 2) Khz is a) 2KHz b) 4KHz c) 8KHz d) 16KHz 3) Radiation pattern of half wave dipole antenna is \_\_\_\_\_ a) Omni-directional b) Uni-directional c) Pattern of Eight d) None What is the maximum modulating frequency allowed in FM broadcastings? 4) a) 40 KHz b) 75 KHz c) 15 KHz d) 120 KHz Indirect Method of FM generation is \_ 5) Reactance modulator b) Varactor diode modulator a) d) Armstrong modulator Transistorized modulator C) Modulation is done in\_\_\_\_\_. 6) Transmitter a) b) Radio receiver Between transmitter and radio receiver C) d) None of the above Superhertodyne principle refers to 7) Using a large number of amplifier stages a) Using a push-pull circuit b) Obtaining lower fixed intermediate frequency c) None of the above d) The IF is 455 kHz. If the radio receiver is tuned to 855 kHz, the local 8) oscillator frequency is \_\_\_\_\_.

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 minute in answer book.

2) All questions are compulsory.

Q1

- The Nguist sample rate for a maximum analog information frequency of 4

- - a) 455KHz b) 1310KHz
  - 1500KHz c) d) 1520KHz
- In an AM wave, the majority of the power is in 9)
  - a) Lower Sideband b) Upper sideband d) None of above c) Carrier

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ANALOG COMMUNICATION

Max. Marks: 70

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14

Marks: 14

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#### 10) Low frequency noise is \_\_\_\_\_.

a) Less than one

- Shot Nosie a)
- c) Flicker Nosie
- b) Thermal Nosie d) None of above
- Nosie figure of an amplifier is always \_ 11)
  - b) Greater than one
  - Equal to one c) d) Equal to 100
- 12) An AM broadcast transmitter has a carrier power of 50KW. with 80% modulation, total power that would be produced will be \_\_\_\_\_. b) 50 KW
  - 40 KW a) 66 KW

c)

- d) 100 KW
- The amount of frequency deviation in FM signal depends on \_\_\_\_\_. 13)
  - a) Amplitude of the modulating signal
  - Carrier frequency b)
  - Modulating frequency c)
  - d) Transmitter amplifier
- 14) Pre emphasis is done
  - For boosting of modulating signal voltage a)
  - For modulating signals at higher frequencies b)
  - In FM before modulation C)
  - d) All of the above

#### S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any four of the following.

- a) Explain the characteristics of AM receiver.
- **b)** Draw the schematic diagram of VSB modulator and explain.
- c) Explain different transmission media used in the communication system.
- d) Write a note on filter method of SSB generation.
- e) The antenna current of an AM transmitter is 8 A, if only the carrier is sent, but it increases to 8.93 A, if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

#### Q.3 Solve any two of the following.

- a) Derive the expression for the total power in the modulated wave and show that 33.33% of the total power is used for information transmission.
- **b)** Derive an expression for Nosie equivalent resistance due to cascading of many amplifier.
- c) Draw and explain super heterodyne receiver. What are its advantages and disadvantages over TRF receiver?

#### Section – II

#### Q.4 Solve any four of the following.

- a) Compare sky-wave and space-wave propagation.
- **b)** What is pre-emphasis? Why is it used? Sketch a typical pre-emphasis circuit and explain why de-emphasis must be used also.
- c) Define Nyquist rate and Nyquist interval.
- d) Explain pulse amplitude modulation method.
- e) What is ground wave propagation? What are its limitation?

#### Q.5 Solve any two of the following.

- a) With block diagram, explain the working of the Armstrong method of FM generation.
- b) Write a short note on.
  - 1) Half dipole antenna
  - 2) Yagi uda antenna
- c) Draw a neat diagram of foster seeley discriminator and explain the working in brief with the help of voltage phasor diagram.

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Set

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Max. Marks: 56

12

16

12

### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II**

Day & Date: Friday, 22-11-2019 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) Assume suitable data if necessary
- 3) Figures to the right indicate full marks
- 4) Use of datasheet and non programmable calculator is allowed.

#### **MCQ/Objective Type Questions**

#### Q.1 **Choose the correct Answer**

C)

**Duration: 30 Minutes** 

- Output resistance of current series negative feedback amplifier \_\_\_\_\_. 1)
  - Increases a)
    - b) Decreases Does not change d) Becomes Unpredictable
- When multistage amplifier is used to amplify DC signal then the coupling 2) used is .

b) Transformer

- a) Direct
- R-C C) d) R-L
- If the transistor is operated in such a way that output current flows for 60° 3) of the input signal then its \_\_\_\_\_operation.
  - a) Class A b) Class B
  - c) Class C d) Class D
- 4) For Wein bridge oscillator a variable capacitor with 47pF and upper limit 470 pF is used, what should be the value of fixed resistance required to provide upper frequency limit of 200KHz.
  - a) 16.92 ohm b) 20.92 ohm
  - 30.92 ohm c) d) None of the these
- When no signal is applied the approximate collector efficiency of Class A 5) power amplifier is .
  - a) 10% b) 0% c) 25% d) 50%
- 6) The frequency response of transformer coupled amplifier is \_\_\_\_\_. a) Good
  - b) Very Good
  - d) Poor c) Excellent
- 7) Cascading two amplifier stages will result in \_
  - reduction in gain and increase in bandwidth a)
  - reduction in gain and reduction in bandwidth b)
  - increase in gain and reduction in bandwidth C)
  - d) increase in gain and increase in bandwidth

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Max. Marks: 70

Marks: 14

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8)	<ul> <li>A pre-regulator is used with a transis</li> <li>a) Increase the input resistance of</li> <li>b) Decrease the input resistance o</li> <li>c) Increase the output resistance o</li> <li>d) Increase the current gain of series</li> </ul>	stor ser f se of se es t	series regulator in order to ies transistor ries transistor eries transistor ransistor
9)	Schmitt trigger is a) Oscillator c) Comparator	b) d)	Amplifier All of these
10)	Sine wave can be converted by a) Rectifier c) Astable multivibrator	b) d)	 Schmitt trigger All of these
11)	In monostable multivibrator quasi sta a) RC c) 1.4 RC	able b) d)	state duration is 0.7 RC None of these
12)	For selecting transistor in multi vibra have a) less td c) less td and tr	tor ( b) d)	design, transistor used should moretf less td, tr, tf, ts
13)	For IC regulators output capacitor is a) Improving stability c) Improve transient response	req b) d)	uired for Short circuit protection Over voltage protection
14)	In IC 555 discharge pin is a) Pin No 2	b)	Pin No 7

c) Pin No 4 d) Pin No 6

### Page **3** of **16**

### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II

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

**Instructions:** 1) All questions are compulsory.

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

#### Section – I

#### Q.2 Attempt Any Four

- a) How overall low frequency response of n identical cascaded amplifier stage can be calculated? What will be overall lower 3dB frequency if three identical amplifier stages having lower cutoff frequency of 64Hz are cascaded?
- **b)** Discuss R-C coupled Multistage amplifier with its advantages and disadvantage. Draw its frequency response.
- c) What is Piezo electric effect? Explain the crystal oscillator circuit with its advantages.
- d) How power amplifiers are classified based on location of Q point on load line?
- e) Three amplifier stages are working in cascade with 0.05V peak to peak input providing 150Vpp output. If voltage gain of first stage is 20 and input to the third stage is 15Vpp Determine.
  - i) Overall voltage gain
  - ii) Voltage gain of second and third stage
  - iii) Input voltage of second stage
- f) A sinusoidal signal Vs=1.95sin400t is applied to the power amplifier. The resulting current is

lo = 12sin400t + 1.2sin800t + 0.9sin1200t + 0.4sin1600t

Calculate the total harmonic distortion and the percentage increase in power because of distortion.

#### Q.3 Attempt Any Two

- a) Design a wein bridge oscillator to provide peak to peak output voltage of 5V at the frequency of 5V at the frequency of 15KHz. Use VCC=12V.
- **b)** Design a class A transformer coupled amplifier to deliver 45mW to the load resistance of 40hm.Use supply voltage of 9Volts.
- c) What is the advantage of negative feedback in amplifiers? Discuss the effect of negative feedback on stability, Band width, noise, distortion, i/p resistance and o/p resistance for different types of negative feedback.

#### Section – II

### Q.4 Attempt Any Four

- a) Derive a frequency of oscillation for Astable multivibrator using IC 555.
- b) Design an adjustable voltage regulator using LM-317 to satisfy following conditions-Vo = 5V to 12V at output current of 1 A.
- c) Explain different triggering methods in transistorized multivibrator circuits.

12

16

Max. Marks: 56





## Set P

- d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of  $10\Omega$  to  $30\Omega$ .
- e) Explain Thermal Shutdown concept in IC Regulator.

#### Q.5 Attempt Any Two

12

- a) Design a Transistorized series voltage regulator for given requirement Vo = 25V, at 50mA, Vin = 30V Assume for Q1,  $h_{fe1} = 100$ ,  $h_{ie1} = 12K\Omega$ ,  $V_{BE1} = 0.6V$ For Q2,  $h_{fe2} = 150$ ,  $h_{ie2} = 3K\Omega$ ,  $V_{BE2} = 0.65V$
- **b)** What are the features of IC regulator? Explain dual tracking voltage regulator.
- c) Design a circuit to switch the system ON-OFF repeatedly for varying ON-OFF periods as follows -
  - 1) ON time variation = 1msec to 3msec
  - 2) OFF time variation = 0.5msec to 2msec
  - System draws a current of 1.5A from 230V mains.

Use Proper IC to drive a relay of 12V,  $40\Omega$ .

### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – 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) Assume suitable data if necessary
- 3) Figures to the right indicate full marks
- 4) Use of datasheet and non programmable calculator is allowed.

#### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Seat

No.

#### Q.1 Choose the correct Answer

- 1) A pre-regulator is used with a transistor series regulator in order to \_\_\_\_\_.
  - a) Increase the input resistance of series transistor
  - b) Decrease the input resistance of series transistor
  - c) Increase the output resistance of series transistor
  - d) Increase the current gain of series transistor

#### 2) Schmitt trigger is \_\_\_\_\_.

- a) Oscillator b) Amplifier
- c) Comparator d) All of these
- 3) Sine wave can be converted by \_\_\_\_\_
  - a) Rectifier b) Schmitt trigger
  - c) Astable multivibrator d) All of these

#### 4) In monostable multivibrator quasi stable state duration is \_\_\_\_\_.

- a) RC b) 0.7 RC
- c) 1.4 RC d) None of these

## 5) For selecting transistor in multi vibrator design, transistor used should have \_\_\_\_\_.

- a) less td b) moretf
- c) less td and tr d) less td, tr, tf, ts

6) For IC regulators output capacitor is required for \_\_\_\_\_

- a) Improving stability
- b) Short circuit protection
- c) Improve transient response d) Over voltage protection
- 7) In IC 555 discharge pin is \_\_\_\_\_.
  - a) Pin No 2 b) Pin No 7
    - c) Pin No 4 d) Pin No 6

#### 8) Output resistance of current series negative feedback amplifier \_\_\_\_\_.

- a) Increases b) Decreases
- c) Does not change d) Becomes Unpredictable

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Max. Marks: 70

Marks: 14

Set | Q

**SLR-FM-232** 

- 9) When multistage amplifier is used to amplify DC signal then the coupling used is . b) Transformer
  - a) Direct
  - R-C c) d) R-L
- 10) If the transistor is operated in such a way that output current flows for 60° of the input signal then its \_\_\_\_\_operation.
  - b) Class B a) Class A
  - Class C d) Class D c)
- 11) For Wein bridge oscillator a variable capacitor with 47pF and upper limit 470 pF is used, what should be the value of fixed resistance required to provide upper frequency limit of 200KHz.
  - 16.92 ohm a) b) 20.92 ohm
  - 30.92 ohm d) None of the these c)
- When no signal is applied the approximate collector efficiency of Class A 12) power amplifier is \_\_\_\_\_.
  - a) 10% b) 0%
  - d) 50% 25% C)
- 13) The frequency response of transformer coupled amplifier is \_\_\_\_\_.
  - a) Good b) Very Good
  - c) Excellent d) Poor
- 14) Cascading two amplifier stages will result in \_
  - reduction in gain and increase in bandwidth a)
  - reduction in gain and reduction in bandwidth b)
  - increase in gain and reduction in bandwidth c)
  - d) increase in gain and increase in bandwidth

16

## SLR-FM-232

Seat	
No.	

### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II

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

Instructions: 1) All questions are compulsory.

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

#### Section – I

#### Q.2 Attempt Any Four

- a) How overall low frequency response of n identical cascaded amplifier stage can be calculated? What will be overall lower 3dB frequency if three identical amplifier stages having lower cutoff frequency of 64Hz are cascaded?
- **b)** Discuss R-C coupled Multistage amplifier with its advantages and disadvantage. Draw its frequency response.
- c) What is Piezo electric effect? Explain the crystal oscillator circuit with its advantages.
- d) How power amplifiers are classified based on location of Q point on load line?
- e) Three amplifier stages are working in cascade with 0.05V peak to peak input providing 150Vpp output. If voltage gain of first stage is 20 and input to the third stage is 15Vpp Determine.
  - i) Overall voltage gain
  - ii) Voltage gain of second and third stage
  - iii) Input voltage of second stage
- f) A sinusoidal signal Vs=1.95sin400t is applied to the power amplifier. The resulting current is

Io = 12sin400t + 1.2sin800t + 0.9sin1200t + 0.4sin1600t

Calculate the total harmonic distortion and the percentage increase in power because of distortion.

### Q.3 Attempt Any Two

- a) Design a wein bridge oscillator to provide peak to peak output voltage of 5V at the frequency of 5V at the frequency of 15KHz. Use VCC=12V.
- **b)** Design a class A transformer coupled amplifier to deliver 45mW to the load resistance of 40hm.Use supply voltage of 9Volts.
- c) What is the advantage of negative feedback in amplifiers? Discuss the effect of negative feedback on stability, Band width, noise, distortion, i/p resistance and o/p resistance for different types of negative feedback.

#### Section – II

#### Q.4 Attempt Any Four

- a) Derive a frequency of oscillation for Astable multivibrator using IC 555.
- b) Design an adjustable voltage regulator using LM-317 to satisfy following conditions-Vo = 5V to 12V at output current of 1 A.
- c) Explain different triggering methods in transistorized multivibrator circuits.

16

12

**- II** Max. Marks: 56

Set

## Set Q

- d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of  $10\Omega$  to  $30\Omega$ .
- e) Explain Thermal Shutdown concept in IC Regulator.

#### Q.5 Attempt Any Two

12

- a) Design a Transistorized series voltage regulator for given requirement Vo = 25V, at 50mA, Vin = 30V Assume for Q1,  $h_{fe1} = 100$ ,  $h_{ie1} = 12K\Omega$ ,  $V_{BE1} = 0.6V$ For Q2,  $h_{fe2} = 150$ ,  $h_{ie2} = 3K\Omega$ ,  $V_{BE2} = 0.65V$
- **b)** What are the features of IC regulator? Explain dual tracking voltage regulator.
- c) Design a circuit to switch the system ON-OFF repeatedly for varying ON-OFF periods as follows -
  - 1) ON time variation = 1msec to 3msec
  - 2) OFF time variation = 0.5msec to 2msec
  - System draws a current of 1.5A from 230V mains.

Use Proper IC to drive a relay of 12V,  $40\Omega$ .

		MCQ/Objective Type Questions	
Dura	tion: 3	30 Minutes	Marks: 2
Q.1	<b>Cho</b> 1)	Sose the correct AnswerWhen no signal is applied the approximate collector efficiencypower amplifier isa) 10%b) 0%c) 25%d) 50%	ency of Class A
	2)	The frequency response of transformer coupled amplifiera)Goodb)Very Goodc)Excellentd)Poor	is
	3)	<ul> <li>Cascading two amplifier stages will result in</li> <li>a) reduction in gain and increase in bandwidth</li> <li>b) reduction in gain and reduction in bandwidth</li> <li>c) increase in gain and reduction in bandwidth</li> <li>d) increase in gain and increase in bandwidth</li> </ul>	
	4)	<ul> <li>A pre-regulator is used with a transistor series regulator in</li> <li>a) Increase the input resistance of series transistor</li> <li>b) Decrease the input resistance of series transistor</li> <li>c) Increase the output resistance of series transistor</li> <li>d) Increase the current gain of series transistor</li> </ul>	order to
	5)	Schmitt trigger isa) Oscillatorb) Amplifierc) Comparatord) All of these	
	6)	Sine wave can be converted bya) Rectifierb) Schmitt triggerc) Astable multivibratord) All of these	
	7)	In monostable multivibrator quasi stable state duration is a) RC b) 0.7 RC c) 1.4 RC d) None of these	
	8)	For selecting transistor in multi vibrator design, transistor have	used should

b) moretf

d) less td, tr, tf, ts

#### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II**

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

less td

less td and tr

a)

c)

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

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

14

14

**SLR-FM-232** 

Set

Max. Marks: 70

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Seat No.

			Set
For	IC regulators output capacitor is	requ	uired for
a) C)	Improve transient response	d)	Over voltage protection
In IC	C 555 discharge pin is		
a)	Pin No 2	b)	Pin No 7
c)	Pin No 4	d)	Pin No 6
Óut	put resistance of current series r	iega	tive feedback amplifier
a)	Increases	b)	Decreases
c)	Does not change	d)	Becomes Unpredictable
Whe use	en multistage amplifier is used to d is	am	olify DC signal then the coupling
a)	Direct	b)	Transformer
c)	R-C	d)	R-L

R

- If the transistor is operated in such a way that output current flows for  $60^{\circ}$ 13) of the input signal then its \_\_\_\_\_operation.
  - a) Class A b) Class B
  - c) Class C d) Class D
- 14) For Wein bridge oscillator a variable capacitor with 47pF and upper limit 470 pF is used, what should be the value of fixed resistance required to provide upper frequency limit of 200KHz.
  - 16.92 ohm a)

9)

10)

11)

12)

30.92 ohm C)

- b) 20.92 ohm
- d) None of the these

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## S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II Day & Date: Friday, 22-11-2019 Ma

Time: 02:30 PM To 05:30 PM

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No.

Instructions: 1) All questions are compulsory.

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

#### Section – I

#### Q.2 Attempt Any Four

- a) How overall low frequency response of n identical cascaded amplifier stage can be calculated? What will be overall lower 3dB frequency if three identical amplifier stages having lower cutoff frequency of 64Hz are cascaded?
- **b)** Discuss R-C coupled Multistage amplifier with its advantages and disadvantage. Draw its frequency response.
- c) What is Piezo electric effect? Explain the crystal oscillator circuit with its advantages.
- d) How power amplifiers are classified based on location of Q point on load line?
- e) Three amplifier stages are working in cascade with 0.05V peak to peak input providing 150Vpp output. If voltage gain of first stage is 20 and input to the third stage is 15Vpp Determine.
  - i) Overall voltage gain
  - ii) Voltage gain of second and third stage
  - iii) Input voltage of second stage
- f) A sinusoidal signal Vs=1.95sin400t is applied to the power amplifier. The resulting current is

lo = 12sin400t + 1.2sin800t + 0.9sin1200t + 0.4sin1600t

Calculate the total harmonic distortion and the percentage increase in power because of distortion.

#### Q.3 Attempt Any Two

- a) Design a wein bridge oscillator to provide peak to peak output voltage of 5V at the frequency of 5V at the frequency of 15KHz. Use VCC=12V.
- **b)** Design a class A transformer coupled amplifier to deliver 45mW to the load resistance of 40hm.Use supply voltage of 9Volts.
- c) What is the advantage of negative feedback in amplifiers? Discuss the effect of negative feedback on stability, Band width, noise, distortion, i/p resistance and o/p resistance for different types of negative feedback.

#### Section – II

#### Q.4 Attempt Any Four

- a) Derive a frequency of oscillation for Astable multivibrator using IC 555.
- b) Design an adjustable voltage regulator using LM-317 to satisfy following conditions-Vo = 5V to 12V at output current of 1 A.
- c) Explain different triggering methods in transistorized multivibrator circuits.

16

12

## 9

Set

Max. Marks: 56

## Set R

- d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of  $10\Omega$  to  $30\Omega$ .
- e) Explain Thermal Shutdown concept in IC Regulator.

#### Q.5 Attempt Any Two

12

- a) Design a Transistorized series voltage regulator for given requirement Vo = 25V, at 50mA, Vin = 30V Assume for Q1,  $h_{fe1} = 100$ ,  $h_{ie1} = 12K\Omega$ ,  $V_{BE1} = 0.6V$ For Q2,  $h_{fe2} = 150$ ,  $h_{ie2} = 3K\Omega$ ,  $V_{BE2} = 0.65V$
- **b)** What are the features of IC regulator? Explain dual tracking voltage regulator.
- c) Design a circuit to switch the system ON-OFF repeatedly for varying ON-OFF periods as follows -
  - 1) ON time variation = 1msec to 3msec
  - 2) OFF time variation = 0.5msec to 2msec
  - System draws a current of 1.5A from 230V mains.

Use Proper IC to drive a relay of 12V,  $40\Omega$ .

No.		S	et	S
		S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II	-	
Day & Time	& Date : 02:3	e: Friday, 22-11-2019 Max. M 0 PM To 05:30 PM	arks	: 70
Instru	uctior	<ul> <li>ns: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in a book.</li> <li>2) Assume suitable data if necessary</li> <li>3) Figures to the right indicate full marks</li> <li>4) Use of datasheet and non programmable calculator is allowed</li> </ul>	ansv I.	ver
		MCQ/Objective Type Questions		
Durat	tion: 3	30 Minutes M	arks	: 14
Q.1	<b>Choo</b> 1)	ose the correct AnswerSine wave can be converted bya) Rectifierb) Schmitt triggerc) Astable multivibratord) All of these		14
	2)	In monostable multivibrator quasi stable state duration is a) RC b) 0.7 RC c) 1.4 RC d) None of these		
	3)	For selecting transistor in multi vibrator design, transistor used should have a) less tdb moretf c) less td and trd) less td, tr, tf, ts		
	4)	For IC regulators output capacitor is required fora) Improving stabilityb) Short circuit protectionc) Improve transient responsed) Over voltage protection		
	5)	In IC 555 discharge pin is a) Pin No 2 b) Pin No 7 c) Pin No 4 d) Pin No 6		
	6)	Output resistance of current series negative feedback amplifiera) Increasesb) Decreasesc) Does not changed) Becomes Unpredictable		
	7)	When multistage amplifier is used to amplify DC signal then the coupling used isa) Directb) Transformer d) R-L	Ĵ	
	8)	If the transistor is operated in such a way that output current flows for 60 of the input signal then itsoperation. a) Class A b) Class B c) Class C d) Class D	) <sup>o</sup>	

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### Seat

c) Class C a) Class



.

- 9) 470 pF is used, what should be the value of fixed resistance required to provide upper frequency limit of 200KHz.
  - 16.92 ohm a) c)

C)

- b) 20.92 ohm
- 30.92 ohm
- d) None of the these
- 10) When no signal is applied the approximate collector efficiency of Class A power amplifier is \_\_\_\_\_.
  - b) 0% a) 10%
    - 25% d) 50%
- 11) The frequency response of transformer coupled amplifier is \_\_\_\_\_.
  - b) Very Good Good a)
  - c) Excellent d) Poor
- 12) Cascading two amplifier stages will result in
  - reduction in gain and increase in bandwidth a)
    - b) reduction in gain and reduction in bandwidth
    - C) increase in gain and reduction in bandwidth
    - increase in gain and increase in bandwidth d)
- 13) A pre-regulator is used with a transistor series regulator in order to \_\_\_\_\_.
  - Increase the input resistance of series transistor a)
  - b) Decrease the input resistance of series transistor
  - Increase the output resistance of series transistor c)
  - Increase the current gain of series transistor d)

#### Schmitt trigger is \_\_\_\_\_. 14)

Oscillator a)

- b) Amplifier
- C) Comparator
- d) All of these

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### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II

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

**Instructions:** 1) All questions are compulsory.

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

#### Section – I

#### Q.2 Attempt Any Four

- a) How overall low frequency response of n identical cascaded amplifier stage can be calculated? What will be overall lower 3dB frequency if three identical amplifier stages having lower cutoff frequency of 64Hz are cascaded?
- **b)** Discuss R-C coupled Multistage amplifier with its advantages and disadvantage. Draw its frequency response.
- c) What is Piezo electric effect? Explain the crystal oscillator circuit with its advantages.
- d) How power amplifiers are classified based on location of Q point on load line?
- e) Three amplifier stages are working in cascade with 0.05V peak to peak input providing 150Vpp output. If voltage gain of first stage is 20 and input to the third stage is 15Vpp Determine.
  - i) Overall voltage gain
  - ii) Voltage gain of second and third stage
  - iii) Input voltage of second stage
- f) A sinusoidal signal Vs=1.95sin400t is applied to the power amplifier. The resulting current is

lo = 12sin400t + 1.2sin800t + 0.9sin1200t + 0.4sin1600t

Calculate the total harmonic distortion and the percentage increase in power because of distortion.

#### Q.3 Attempt Any Two

- a) Design a wein bridge oscillator to provide peak to peak output voltage of 5V at the frequency of 5V at the frequency of 15KHz. Use VCC=12V.
- **b)** Design a class A transformer coupled amplifier to deliver 45mW to the load resistance of 40hm.Use supply voltage of 9Volts.
- c) What is the advantage of negative feedback in amplifiers? Discuss the effect of negative feedback on stability, Band width, noise, distortion, i/p resistance and o/p resistance for different types of negative feedback.

### Section – II

### Q.4 Attempt Any Four

- a) Derive a frequency of oscillation for Astable multivibrator using IC 555.
- b) Design an adjustable voltage regulator using LM-317 to satisfy following conditions-Vo = 5V to 12V at output current of 1 A.
- c) Explain different triggering methods in transistorized multivibrator circuits.

16



Max. Marks: 56

## Set S

- d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of  $10\Omega$  to  $30\Omega$ .
- e) Explain Thermal Shutdown concept in IC Regulator.

#### Q.5 Attempt Any Two

12

- a) Design a Transistorized series voltage regulator for given requirement Vo = 25V, at 50mA, Vin = 30V Assume for Q1,  $h_{fe1} = 100$ ,  $h_{ie1} = 12K\Omega$ ,  $V_{BE1} = 0.6V$ For Q2,  $h_{fe2} = 150$ ,  $h_{ie2} = 3K\Omega$ ,  $V_{BE2} = 0.65V$
- **b)** What are the features of IC regulator? Explain dual tracking voltage regulator.
- c) Design a circuit to switch the system ON-OFF repeatedly for varying ON-OFF periods as follows -
  - 1) ON time variation = 1msec to 3msec
  - 2) OFF time variation = 0.5msec to 2msec
  - System draws a current of 1.5A from 230V mains.

Use Proper IC to drive a relay of 12V,  $40\Omega$ .

### DATA STRUCTURE Max. Marks: 70 book. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 14 Stack b) d) Linked list In a circular linked list b) front=rear=0 d) none of the above AB\*CD/+ b) d) ABCD+/\* b) Stack List d) Factorial (0) is \_\_\_\_\_. b) 1

- Linked lists are not suitable for a) Insertion sort **Binary search** b)
  - Polynominal manipulation c) Radix Sort d)
- 8) Binary trees can have how many children?
  - a) 2 b) any number of children c) 0 or 1 or 2 d) 0 or 1
- 9) The Data structure used in standard implementation of Breadth First Search is
  - a) Stack b) Queue Linked List d) none of the mentioned c)

Seat No.

2)

6)

7)

## S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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

- 2) Figures to the right indicate full marks.
- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
  - A linear list of elements in which deletion can be done from one end (front) 1) and insertion can take place only at the other end (rear) is known as a \_\_\_\_\_.
    - a) Queue
    - c) Tree
    - a) Components are all linked together in some sequential manner
    - b) There is no beginning and no end
    - c) Components are arranged hierarchically
    - d) Forward and backward traversal within the list is permitted

#### 3) Pverflow condition of stack is \_\_\_\_

- a) front=rear=max-1
- c) top=max-1
- 4) The postfix form of  $A^*B+C/D$  is?
  - a) \*AB/CD+
  - c) A\*BC+/D
- Which data structure is used for implementing recursion? 5)
  - a) Queue c) Array
  - - a) 0
    - Undefined c) infinity d)

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Set P 10) What is the worst case for linear search? O(logn) a) O(nlogn) b) c) O(n) d) O(1) The complexity of Binary search algorithm is \_\_\_\_ 11) . a) O (n2) b) O (log) c) O (n) d) O (n log n) \_\_\_\_\_ is putting an element in the appropriate place in a sorted list 12) yields a larger sorted order list. a) Distribution b) Extraction c) Selection d) Insertion 13) Partition and exchange sort is \_\_\_\_ b) tree sort a) quick sort c) heap sort bubble sort d) Merge sort uses \_\_\_\_\_ 14) a) Greedy approach b) Backtracking c) Heuristic approach d) Divide-and-conquer

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#### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURE

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

#### Section – I

#### **Q.2** Attempt any four of the following questions.

- a) Explain the representation of doubly linked list with example.
- b) What is double ended queue? Explain with neat diagram.
- c) Write a C program to find the multiplication of two natural number with recursion function.
- d) Explain difference between static memory allocation and dynamic memory allocation
- e) Convert the following infix expression to postfix expression  $A B/(C * D \land E)$

#### Q.3 Attempt any two of the following questions.

- a) Write a C program to implement following operation on singly link list.
  - i) Creation of list
  - ii) Insertion of element at end
  - iii) Deletion of given element from the list
  - iv) Display
- **b)** Write an algorithm for Enqueue and Dequeue operation performed on Circular Queue.
- c) Write a C program of stack using array.

#### Q.4 Attempt any four of the following questions.

- a) Explain various tree traversal methods with example.
- **b)** Write a short note on B Tree and B+ Tree.
- c) Explain bubble sort. Sort the following using bubble sort 36, 20, 68, 55, 94, 18, 41. Show the steps for each iteration.
- d) Explain Binary search algorithm with example.
- e) Differentiate between DFS and BFS.

#### Q.5 Attempt any two of the following questions.

- a) Define Graph and explain various graph representation techniques.
- **b)** Write a C program to search an element from an array using linear search.
- c) What is hash collision? Explain collision resolving techniques.

12

16

Max. Marks: 56

12

Day Time	& Date : 02:3	e: Sa 0 PN	aturday, 23-11-2019 И То 05:30 РМ		Max. Marks	: 70
Instr	uctio	ns: 1 2	<ol> <li>Q. No. 1 is compulso book.</li> <li>Figures to the right in</li> </ol>	ry and should dicate full mar	be solved in first 30 minutes in ansv <sup>.</sup> ks.	ver
			MCQ/Obie	ective Type	Questions	
Dura	ition: 3	80 M	inutes		Marks	: 14
Q.1	<b>Cho</b> 1)	ose Bin	the correct alternative ary trees can have how	es from the op many childre	<b>otions and rewrite the sentence.</b> n?	14
		a) c)	2 0 or 1 or 2	b) d)	any number of children 0 or 1	
	2)	The Sea a) c)	e Data structure used in arch is Stack Linked List	n standard imp b) d)	lementation of Breadth First Queue none of the mentioned	
	3)	Wh a) c)	at is the worst case for O(nlogn) O(n)	linear search? b) d)	? O(logn) O(1)	
	4)	The a) c)	e complexity of Binary s O (n2) O (n)	earch algorith b) d)	m is O (log) O (n log n)	
	5)	yie a) c)	is putting an ele lds a larger sorted orde Distribution Selection	ement in the ap r list. b) d)	opropriate place in a sorted list Extraction Insertion	
	6)	Pai a) c)	rtition and exchange so quick sort heap sort	rt isb) d)	tree sort bubble sort	
	7)	Me a) c)	rge sort uses Greedy approach Heuristic approach	 b) d)	Backtracking Divide-and-conquer	
	8)	A li anc a) c)	near list of elements in d insertion can take plac Queue Tree	which deletior ce only at the o b) d)	n can be done from one end (front) other end (rear) is known as a Stack Linked list	
	9)	In a a) b)	a circular linked list Components are all lir There is no beginning	hked together i and no end	in some sequential manner	

Seat

No.

- c) Components are arranged hierarchicallyd) Forward and backward traversal within the list is permitted





Set Q

## **SLR-FM-233** Set Q

- Pverflow condition of stack is \_\_\_\_\_ 10)
  - a) front=rear=max-1
- b) front=rear=0
- c) top=max-1 d)
- none of the above

#### 11) The postfix form of $A^B+C/D$ is?

- a) \*AB/CD+ b) AB\*CD/+
- c) A\*BC+/D ABCD+/\* d)

#### Which data structure is used for implementing recursion? 12)

- Stack a) Queue b) List
- c) Array d)
- Factorial (0) is \_\_\_\_\_. 13)
  - a) 0
  - b) 1 d) Undefined c) infinity
- Linked lists are not suitable for \_\_\_\_ 14)
  - a) Insertion sort c) Radix Sort
- \_· b) Binary search
- Polynominal manipulation d)

#### S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURE

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four of the following questions.

- a) Explain the representation of doubly linked list with example.
- **b)** What is double ended queue? Explain with neat diagram.
- c) Write a C program to find the multiplication of two natural number with recursion function.
- d) Explain difference between static memory allocation and dynamic memory allocation
- e) Convert the following infix expression to postfix expression  $A B/(C^*D \wedge E)$

#### Q.3 Attempt any two of the following questions.

- a) Write a C program to implement following operation on singly link list.
  - i) Creation of list
  - ii) Insertion of element at end
  - iii) Deletion of given element from the list
  - iv) Display
- **b)** Write an algorithm for Enqueue and Dequeue operation performed on Circular Queue.
- c) Write a C program of stack using array.

#### Q.4 Attempt any four of the following questions.

- a) Explain various tree traversal methods with example.
- **b)** Write a short note on B Tree and B+ Tree.
- c) Explain bubble sort. Sort the following using bubble sort 36, 20, 68, 55, 94, 18, 41. Show the steps for each iteration.
- **d)** Explain Binary search algorithm with example.
- e) Differentiate between DFS and BFS.

### Q.5 Attempt any two of the following questions.

- a) Define Graph and explain various graph representation techniques.
- **b)** Write a C program to search an element from an array using linear search.
- c) What is hash collision? Explain collision resolving techniques.

Max. Marks: 56

12

16

12

**Electronics & Telecommunication Engineering** DATA STRUCTURE Max. Marks: 70 book. MCQ/Objective Type Questions Marks: 14 Which data structure is used for implementing recursion? Stack b) List d) b) 1 d) Undefined a) Insertion sort b) Binary search Polynominal manipulation d) any number of children b) d) 0 or 1

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019

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

2) Figures to the right indicate full marks.

#### **Duration: 30 Minutes**

1)

2)

Seat

No.

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

- a) Queue c) Array Factorial (0) is \_\_\_\_\_. a) 0
- c) infinity
- 3) Linked lists are not suitable for
  - c) Radix Sort
- 4) Binary trees can have how many children?
  - a) 2 c) 0 or 1 or 2
- The Data structure used in standard implementation of Breadth First 5) Search is \_\_\_\_\_.
  - a) Stack b) Queue
  - none of the mentioned c) Linked List d)

6) What is the worst case for linear search?

> a) O(nlogn) O(logn) b) O(1) c) O(n) d)

7) The complexity of Binary search algorithm is \_\_\_\_\_. a) O (n2) O (log) b)

O (n log n) c) O (n) d)

- 8) is putting an element in the appropriate place in a sorted list yields a larger sorted order list.
  - a) Distribution b) Extraction
  - c) Selection d) Insertion
- 9) Partition and exchange sort is \_\_\_\_
  - b) tree sort a) quick sort
  - c) heap sort d) bubble sort

**SLR-FM-233** 

Set

- 10) Merge sort uses \_\_\_\_\_.
  - a) Greedy approach
  - c) Heuristic approach
- b) Backtracking

Set R

- d) Divide-and-conquer
- 11) A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a \_\_\_\_\_.
  - a) Queue b) Stack
  - c) Tree d) Linked list
- 12) In a circular linked list \_
  - a) Components are all linked together in some sequential manner
  - b) There is no beginning and no end
  - c) Components are arranged hierarchically
  - d) Forward and backward traversal within the list is permitted
- 13) Pverflow condition of stack is \_\_\_\_\_
  - a) front=rear=max-1
- b) front=rear=0
- d) none of the above
- 14) The postfix form of  $A^*B+C/D$  is?
  - a) \*AB/CD+

c) top=max-1

c) A\*BC+/D

- b) AB\*CD/+
- d) ABCD+/\*
# Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURE

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

# Section – I

# Q.2 Attempt any four of the following questions.

- a) Explain the representation of doubly linked list with example.
- b) What is double ended queue? Explain with neat diagram.
- c) Write a C program to find the multiplication of two natural number with recursion function.
- d) Explain difference between static memory allocation and dynamic memory allocation
- e) Convert the following infix expression to postfix expression  $A B/(C * D \land E)$

# Q.3 Attempt any two of the following questions.

- a) Write a C program to implement following operation on singly link list.
  - i) Creation of list
  - ii) Insertion of element at end
  - iii) Deletion of given element from the list
  - iv) Display
- **b)** Write an algorithm for Enqueue and Dequeue operation performed on Circular Queue.
- c) Write a C program of stack using array.

# Q.4 Attempt any four of the following questions.

- a) Explain various tree traversal methods with example.
- **b)** Write a short note on B Tree and B+ Tree.
- c) Explain bubble sort. Sort the following using bubble sort 36, 20, 68, 55, 94, 18, 41. Show the steps for each iteration.
- d) Explain Binary search algorithm with example.
- e) Differentiate between DFS and BFS.

# Q.5 Attempt any two of the following questions.

- a) Define Graph and explain various graph representation techniques.
- **b)** Write a C program to search an element from an array using linear search.
- c) What is hash collision? Explain collision resolving techniques.

12

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Max. Marks: 56

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S.E	. (Part – II) (New) (CBCS) Electronics & Telecomr DATA STF	Exar nunic RUCT	mination Nov/Dec-2019 ation Engineering URE
te: Sa 30 PN	turday, 23-11-2019 / To 05:30 PM		Max. Marks: 70
ons: 1	) Q. No. 1 is compulsory and s book.	hould	be solved in first 30 minutes in answer
2		uli mar	KS.
30 Mi	nutes	Гуре	Questions Marks: 14
<b>bose</b> f Wh a) c)	the correct alternatives from at is the worst case for linear s O(nlogn) O(n)	the or earch? b) d)	O(logn) O(1)
The a) c)	e complexity of Binary search a O (n2) O (n)	lgorith b) d)	m is O (log) O (n log n)
yiel a) c) Par a) c)	is putting an element in ds a larger sorted order list. Distribution Selection tition and exchange sort is quick sort heap sort	the ap b) d) b) d)	propriate place in a sorted list Extraction Insertion tree sort bubble sort
Me a) c)	rge sort uses Greedy approach Heuristic approach	b) d)	Backtracking Divide-and-conquer
A li anc a) c)	near list of elements in which d l insertion can take place only a Queue Tree	leletior at the d b) d)	n can be done from one end (front) other end (rear) is known as a Stack Linked list
In a a) b) c) d)	a circular linked list Components are all linked tog There is no beginning and no Components are arranged hie Forward and backward travers	iether i end erarchio sal with	in some sequential manner cally hin the list is permitted
Pve a) c)	erflow condition of stack is front=rear=max-1 top=max-1	b) d)	front=rear=0 none of the above

Day & Dat Time: 02:3

Instructio

Duration:

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No.

# Q.1 Cho

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9) The postfix form of A\*B+C/D is?
  - a) <sup>\*</sup>AB/CD+
  - c) A\*BC+/D

- AB\*CD/+ b)
- d) ABCD+/\*



SLR-FM-233

Which data structure is used for implementing recursion? 10)

- a) Queue Stack b)
- c) Array d) List
- 11) Factorial (0) is \_\_\_\_\_.
  - a) 0 b) 1 Undefined
  - c) infinity d)
- Linked lists are not suitable for \_\_\_\_ 12) \_.
  - a) Insertion sort b) Binary search
  - Polynominal manipulation c) Radix Sort d)
- 13) Binary trees can have how many children?
  - a) 2 any number of children b)
  - c) 0 or 1 or 2 0 or 1 d)
- 14) The Data structure used in standard implementation of Breadth First Search is \_\_\_\_\_.
  - a) Stack c) Linked List
- b) Queue
- d) none of the mentioned

**SLR-FM-233** 

Set S

# Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURE

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

# Section – I

# **Q.2** Attempt any four of the following questions.

- a) Explain the representation of doubly linked list with example.
- b) What is double ended queue? Explain with neat diagram.
- c) Write a C program to find the multiplication of two natural number with recursion function.
- d) Explain difference between static memory allocation and dynamic memory allocation
- e) Convert the following infix expression to postfix expression  $A B/(C * D \land E)$

# Q.3 Attempt any two of the following questions.

- a) Write a C program to implement following operation on singly link list.
  - i) Creation of list
  - ii) Insertion of element at end
  - iii) Deletion of given element from the list
  - iv) Display
- **b)** Write an algorithm for Enqueue and Dequeue operation performed on Circular Queue.
- c) Write a C program of stack using array.

# Q.4 Attempt any four of the following questions.

- a) Explain various tree traversal methods with example.
- **b)** Write a short note on B Tree and B+ Tree.
- c) Explain bubble sort. Sort the following using bubble sort 36, 20, 68, 55, 94, 18, 41. Show the steps for each iteration.
- d) Explain Binary search algorithm with example.
- e) Differentiate between DFS and BFS.

# Q.5 Attempt any two of the following questions.

- a) Define Graph and explain various graph representation techniques.
- **b)** Write a C program to search an element from an array using linear search.
- c) What is hash collision? Explain collision resolving techniques.

12

16

Max. Marks: 56

16

Set

Max. Marks: 70

Marks: 14

Seat	
No.	

# S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 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) Assume suitable data if necessary.

# **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

C)

C)

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

- 1) Which of the following is closed loop system?
  - a) Electric switch

c) car starter

b) D-C generator d) Autopiolet for an air craft

b) displacement (x)

- The current in electrical circuit is analogous to \_\_\_\_\_in mechanical 2) translational system.
  - a) Mass (M)
    - velocity d) force (F)
- A control system in which control action is dependent on output is known 3) as
  - Open loop system a) closed system
- b) semiclosed system
- d) indeterminist
- 4) The characteristics equation (S +1)(S +2)(S - 3) represents a \_\_\_\_\_.
  - Stable system a) marginally stable C)
- b) unstable system
- d) indeterminist
- The transfer function  $P(S) = \frac{(2S+1)}{(S^2+S+1)}$  represents. 5)
  - a) Stable system b) unstable system
  - marginally stable d) indeterminist C)
- Which of following element is not used in automatic control system? 6)
  - a) Sensor b) error detector
  - c) Oscillator d) final control element
- From the signal flow graph shown in figure below, x6= 7)



- (ax1 + bx2 + cx3)(d+e)a)
- b) (a+b+c)(x1+x2+x3)(d+e)d) abcde(x1 + x2 + x3)
- de(ax1 + bx2 + cx3)C)

					Set	Ρ	
8)	Whi ban	ich of the following compensator dwidth of a control system?	will	be used to increase the			
	a) c)	phase lag phase lead	b) d)	phase lag lead none of above			
9)	For a) b) c) d)	making an unstable system stab gain of system should be increa gain of system should be decre the number of zeros to the oper increased the number of poles to the oper increased	ole _ used asec n loo n loo	 p transfer function should be p transfer function should be			
10)	Wha ima a)	at will be nature of system, if the ginary axis in S-plane? marginally stable	pole	es of system are lying on the conditionally stable			
11)	c) Dar	stable	a)	Zero			
,	a)	gain	b)	1 gain			
	c)	√gain	d)	$\frac{1}{\sqrt{\text{gain}}}$			
12)	The	type 1 system hasat the	origi	n.			
	a) c)	simple pole	d)	two poles			
13)	Lag a) c)	compensator reduces bandwidth transient response	b) d)	rise time all of these			
14)	lf bo a)	oth gain and phase margin are postable	ositiv b)	ve then the system is unstable			

c) indeterminist

d) marginally stable

SLR-FM-234

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

# **CONTROL SYSTEMS**

Day & Date: Monday, 25-11-2019

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) Assume suitable data if necessary.

### Section – I

# Q.2 Attempt any four questions.

- Define control system. Explain types of control system a)
- Find transfer function of following system. b)

Vi



- What is translation motion? Explain the forces that resists translational d) motion.
- e) When a system is said to be stable? What is effect of location of poles on stability when
  - poles on negative real axis 1)
  - 2) poles on positive axis
  - poles at origin 3)
- Q.3 a) Find transfer function of system given in figure.



By means of Routh criterion, determine the stability of system given by b) 06 characteristic equation  $S^{6} + 3S^{5} + 5S^{4} + 9S^{3} + 8S^{2} + 6S + 4 = 0$ 

OR

Max. Marks: 56

16

06

Set

SLR-FM-234

Find transfer function of signal flow graph given in figure by using Masson b) 06 gain formula.



### Section – II

### Attempt any four questions. Q.4

Determine different error constants for a system having a)  $H(S) = \frac{10}{S+4}$ Κ  $G(S) = \frac{K}{S(S^2 + 2S + 5)}$ 

Also determine steady state error if input is  $r(t) = 5+10t+t^2$ 

- Explain lead compensator. b)
- c) What is type of system and order of system? Explain type 0 and type 1 system.
- d) Define terms
  - a) delay time (td)
  - rise time (tr) b)
  - c) peak overshoot (Mp)
  - d) settling time (ts)
- Explain rules for construction of root locus. e)

### Q.5 Attempt any two

The forward path transfer function of unity feedback is given as a)

Κ  $G(S) = \frac{K}{S(S+4)(S+5)}$ 

Sketch root locus as K varies from zero to infinity.

A unity feedback system has  $G(S) = \frac{10}{S(S+4)}$  If step input is applied calculate. b)

- 1) natural frequency of oscillation
- 2) damping factor
- damping frequency
- 4) peak time tp
- delay time td 5)
- peak overshoot Mp 6)
- Sketch Bode plot for transfer function c)

$$G(S) = \frac{1000}{(1+0.1S)(1+0.001S)}$$

Determine

- Phase Margin 1)
- 2) Gain Margin
- Comment on stability of system 3)

**SLR-FM-234** 

Set

16

Set

Max. Marks: 70

Marks: 14

Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CONTROL SYSTEMS**

Day & Date: Monday, 25-11-2019 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.
  - Assume suitable data if necessary.

# **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

2)

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

- Which of the following compensator will be used to increase the 1) bandwidth of a control system?
  - a) phase lag
  - c) phase lead
  - For making an unstable system stable \_\_\_\_
  - gain of system should be increased a)
    - gain of system should be decreased b)
    - the number of zeros to the open loop transfer function should be C) increased
    - the number of poles to the open loop transfer function should be d) increased
- 3) What will be nature of system, if the poles of system are lying on the imaginary axis in S-plane?
  - a) marginally stable stable
- b) conditionally stable d) Zero
- c) 4) Damping is proportional to \_\_\_\_\_. gain a)
  - C)  $\sqrt{\text{gain}}$

b) 
$$\frac{1}{\text{gain}}$$
  
d)  $\frac{1}{\sqrt{\text{gain}}}$ 

- The type 1 system has \_\_\_\_\_at the origin. 5)
  - a) no pole b) no zero
  - c) simple pole d) two poles
- 6) Lag compensator reduces \_\_\_\_\_.
  - a) bandwidth b) rise time d) all of these C)
    - transient response
- If both gain and phase margin are positive then the system is \_\_\_\_\_. 7)
  - stable a) indeterminist

c)

b) unstable d) marginally stable

- d) none of above
- b) phase lag lead

#### 8) Which of the following is closed loop system?

a) Electric switch car starter

C)

- b) D-C generator
- d) Autopiolet for an air craft
- 9) The current in electrical circuit is analogous to \_\_\_\_\_in mechanical translational system.
  - a) Mass (M) b) displacement (x)
  - c) velocity
- d) force (F)
- A control system in which control action is dependent on output is known 10) as
  - Open loop system a)
  - closed system c)
- b) semiclosed system
- 11) The characteristics equation (S +1)(S +2)(S - 3) represents a \_\_\_\_\_.
  - a) Stable system
  - c) marginally stable

marginally stable

- The transfer function  $P(S) = \frac{(2S+1)}{(S^2+S+1)}$  represents. 12)
  - Stable system a)

c)

- b) unstable system
- d) indeterminist
- 13) Which of following element is not used in automatic control system?
  - Sensor b) error detector a) d) final control element
  - Oscillator C)
- From the signal flow graph shown in figure below, x6= 14)



- (ax1 + bx2 + cx3)(d+e)a)
- C) de(ax1 + bx2 + cx3)
- b) (a + b + c)(x1 + x2 + x3)(d + e)
- d) abcde(x1 + x2 + x3)

- d) indeterminist
- b) unstable system
  - d) indeterminist

**SLR-FM-234** 



# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

# **CONTROL SYSTEMS**

Day & Date: Monday, 25-11-2019

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) Assume suitable data if necessary.

# Section – I

# Q.2 Attempt any four questions.

- Define control system. Explain types of control system a)
- Find transfer function of following system. b)

Vi



- What is translation motion? Explain the forces that resists translational d) motion.
- e) When a system is said to be stable? What is effect of location of poles on stability when
  - poles on negative real axis 1)
  - 2) poles on positive axis
  - poles at origin 3)
- Q.3 a) Find transfer function of system given in figure.



By means of Routh criterion, determine the stability of system given by b) 06 characteristic equation  $S^{6} + 3S^{5} + 5S^{4} + 9S^{3} + 8S^{2} + 6S + 4 = 0$ 

OR

Max. Marks: 56

06





SLR-FM-234

Find transfer function of signal flow graph given in figure by using Masson b) 06 gain formula.



### Section – II

### Attempt any four questions. Q.4

Determine different error constants for a system having a)  $H(S) = \frac{10}{S+4}$ Κ  $G(S) = \frac{K}{S(S^2 + 2S + 5)}$ 

Also determine steady state error if input is  $r(t) = 5+10t+t^2$ 

- Explain lead compensator. b)
- c) What is type of system and order of system? Explain type 0 and type 1 system.
- d) Define terms
  - a) delay time (td)
  - b) rise time (tr)
  - c) peak overshoot (Mp)
  - d) settling time (ts)
- Explain rules for construction of root locus. e)

### Q.5 Attempt any two

The forward path transfer function of unity feedback is given as a)

Κ  $G(S) = \frac{K}{S(S+4)(S+5)}$ 

Sketch root locus as K varies from zero to infinity.

A unity feedback system has  $G(S) = \frac{10}{S(S+4)}$  If step input is applied calculate. b)

- 1) natural frequency of oscillation
- 2) damping factor
- damping frequency
- 4) peak time tp
- delay time td 5)
- peak overshoot Mp 6)
- Sketch Bode plot for transfer function c) 0

$$(s) = \frac{100}{100}$$

$$G(S) = \frac{1000}{(1+0.1S)(1+0.001S)}$$

Determine

- Phase Margin 1)
- 2) Gain Margin
- Comment on stability of system 3)

**SLR-FM-234** Q Set

16

Set

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CONTROL SYSTEMS**

Day & Date: Monday, 25-11-2019 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.
  - Assume suitable data if necessary.

# **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

a)

a)

c)

4)

C)

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

 $\Rightarrow \overset{\mathsf{d}}{\xrightarrow{x4}} \overset{\mathsf{e}}{\xrightarrow{x5}} \overset{\mathsf{e}}{\xrightarrow{x5}}$ 

- The transfer function  $P(S) = \frac{(2S+1)}{(S^2+S+1)}$  represents. 1)
  - a) Stable system
  - marginally stable C)
- 2) Which of following element is not used in automatic control system?
  - Sensor a)
  - c) Oscillator d) final control element
- From the signal flow graph shown in figure below, x6= 3)

5) For making an unstable system stable

(ax1 + bx2 + cx3)(d+e)

de(ax1 + bx2 + cx3)

bandwidth of a control system?

phase lag

phase lead

- gain of system should be increased a)
- gain of system should be decreased b)
- the number of zeros to the open loop transfer function should be c) increased
- the number of poles to the open loop transfer function should be d) increased
- What will be nature of system, if the poles of system are lying on the 6) imaginary axis in S-plane?

Which of the following compensator will be used to increase the

- marginally stable a) stable c)
- b) conditionally stable
- d) Zero

- b) (a+b+c)(x1+x2+x3)(d+e)
- d) abcde(x1 + x2 + x3)

b) phase lag lead

d) none of above

Marks: 14

Max. Marks: 70



**SLR-FM-234** 



b) unstable system

d) indeterminist

Seat

No.



		SLR-FM-234
		Set R
7)	Damping is proportional to a) c) √gain	b) $\frac{1}{\text{gain}}$ d) $\frac{1}{\sqrt{\text{gain}}}$
8)	The type 1 system hasat the a) no pole c) simple pole	e origin. b) no zero d) two poles
9)	Lag compensator reduces a) bandwidth c) transient response	<ul><li>b) rise time</li><li>d) all of these</li></ul>
10)	If both gain and phase margin are p a) stable c) indeterminist	positive then the system is b) unstable d) marginally stable
11)	<ul><li>Which of the following is closed loc</li><li>a) Electric switch</li><li>c) car starter</li></ul>	op system? b) D-C generator d) Autopiolet for an air craft
12)	The current in electrical circuit is an translational system. a) Mass (M) c) velocity	nalogous toin mechanical b) displacement (x) d) force (F)
13)	A control system in which control a as a) Open loop system c) closed system	action is dependent on output is known b) semiclosed system d) indeterminist

The characteristics equation (S +1)(S +2)(S - 3) represents a \_\_\_\_\_.a) Stable systemb) unstable systemc) marginally stabled) indeterminist 14)

# Seat <u>No.</u> S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

# Section – I

**CONTROL SYSTEMS** 

# Q.2 Attempt any four questions.

- a) Define control system. Explain types of control system
- b) Find transfer function of following system.

Vi



- **d)** What is translation motion? Explain the forces that resists translational motion.
- e) When a system is said to be stable? What is effect of location of poles on stability when
  - 1) poles on negative real axis
  - 2) poles on positive axis
  - 3) poles at origin
- **Q.3 a)** Find transfer function of system given in figure.



b) By means of Routh criterion, determine the stability of system given by 06 characteristic equation

 $S^{6} + 3S^{5} + 5S^{4} + 9S^{3} + 8S^{2} + 6S + 4 = 0$ OR Max. Marks: 56

16

06

Set R

SLR-FM-234

Find transfer function of signal flow graph given in figure by using Masson b) 06 gain formula.



### Section – II

### Attempt any four questions. Q.4

Determine different error constants for a system having a)  $H(S) = \frac{10}{S+4}$ Κ  $G(S) = \frac{K}{S(S^2 + 2S + 5)}$ 

Also determine steady state error if input is  $r(t) = 5+10t+t^2$ 

- b) Explain lead compensator.
- c) What is type of system and order of system? Explain type 0 and type 1 system.
- d) Define terms
  - a) delay time (td)
  - b) rise time (tr)
  - c) peak overshoot (Mp)
  - d) settling time (ts)
- Explain rules for construction of root locus. e)

### Q.5 Attempt any two

The forward path transfer function of unity feedback is given as a)

Κ  $G(S) = \frac{K}{S(S+4)(S+5)}$ 

Sketch root locus as K varies from zero to infinity.

A unity feedback system has  $G(S) = \frac{10}{S(S+4)}$  If step input is applied calculate. b)

- 1) natural frequency of oscillation
- 2) damping factor
- damping frequency
- 4) peak time tp
- delay time td 5)
- peak overshoot Mp 6)
- C) Sketch Bode plot for transfer function 0

$$(s) = \frac{100}{100}$$

$$G(S) = \frac{1000}{(1+0.1S)(1+0.001S)}$$

Determine

- Phase Margin 1)
- 2) Gain Margin
- Comment on stability of system 3)

16

**SLR-FM-234** 

Set

Set

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CONTROL SYSTEMS**

Day & Date: Monday, 25-11-2019 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.
  - Assume suitable 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

- What will be nature of system, if the poles of system are lying on the 1) imaginary axis in S-plane?
  - a) marginally stable b) conditionally stable
    - stable d) Zero c)
- 2) Damping is proportional to \_\_\_\_\_. gain 1 gain a) b)
  - C) √gain
- 3) The type 1 system has \_\_\_\_\_at the origin.
  - a) no pole b) no zero c) simple pole d) two poles
- 4) Lag compensator reduces \_\_\_\_\_. a) bandwidth b) rise time
  - c) transient response d) all of these
- 5) If both gain and phase margin are positive then the system is \_\_\_\_\_.
  - a) stable b) unstable c) indeterminist d) marginally stable
- 6) Which of the following is closed loop system?
  - a) Electric switch b) D-C generator
    - d) Autopiolet for an air craft c) car starter
- The current in electrical circuit is analogous to \_\_\_\_\_in mechanical 7) translational system.
  - a) Mass (M) b) displacement (x) c) velocity
    - d) force (F)
- A control system in which control action is dependent on output is known 8) as
  - Open loop system a)

closed system

C)

- b) semiclosed system
- d) indeterminist

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Marks: 14

Max. Marks: 70

Page 14 of 16

- The characteristics equation (S +1)(S +2)(S 3) represents a \_\_\_\_\_. 9)
  - Stable system a)

b) unstable system

SLR-FM-234

Set S

- marginally stable C)
- d) indeterminist
- The transfer function  $P(S) = \frac{(2S+1)}{(S^2+S+1)}$  represents. 10)
  - Stable system a) marginally stable

Sensor

Oscillator

c)

a)

c)

- b) unstable system d) indeterminist
- Which of following element is not used in automatic control system? 11)
- b) error detector d) final control element
- 12) From the signal flow graph shown in figure below, x6=



- (ax1 + bx2 + cx3)(d+e)a)
- b) (a+b+c)(x1+x2+x3)(d+e)
- C) de(ax1 + bx2 + cx3)
- d) abcde(x1 + x2 + x3)
- Which of the following compensator will be used to increase the 13) bandwidth of a control system?
  - a) phase lag

b) phase lag lead

c) phase lead

- d) none of above
- For making an unstable system stable 14)
  - gain of system should be increased a)
  - gain of system should be decreased b)
  - the number of zeros to the open loop transfer function should be C) increased
  - the number of poles to the open loop transfer function should be d) increased

# Seat S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Monday, 25-11-2019

Time: 02:30 PM To 05:30 PM

No.

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

# Section – I

**CONTROL SYSTEMS** 

# Q.2 Attempt any four questions.

- Define control system. Explain types of control system a)
- Find transfer function of following system. b)

Vi



- What is translation motion? Explain the forces that resists translational d) motion.
- e) When a system is said to be stable? What is effect of location of poles on stability when
  - poles on negative real axis 1)
  - 2) poles on positive axis
  - poles at origin 3)
- Q.3 a) Find transfer function of system given in figure.



By means of Routh criterion, determine the stability of system given by b) 06 characteristic equation

 $S^6 + 3S^5 + 5S^4 + 9S^3 + 8S^2 + 6S + 4 = 0$ OR Max. Marks: 56

06

Set



SLR-FM-234

Find transfer function of signal flow graph given in figure by using Masson b) 06 gain formula.



# Section – II

### Attempt any four questions. Q.4

Determine different error constants for a system having a)  $H(S) = \frac{10}{S+4}$ Κ  $G(S) = \frac{K}{S(S^2 + 2S + 5)}$ 

Also determine steady state error if input is  $r(t) = 5+10t+t^2$ 

- b) Explain lead compensator.
- c) What is type of system and order of system? Explain type 0 and type 1 system.
- d) Define terms
  - a) delay time (td)
  - b) rise time (tr)
  - c) peak overshoot (Mp)
  - d) settling time (ts)
- Explain rules for construction of root locus. e)

### Q.5 Attempt any two

The forward path transfer function of unity feedback is given as a)

Κ  $G(S) = \frac{K}{S(S+4)(S+5)}$ 

Sketch root locus as K varies from zero to infinity.

A unity feedback system has  $G(S) = \frac{10}{S(S+4)}$  If step input is applied calculate. b)

- 1) natural frequency of oscillation
- 2) damping factor
- damping frequency
- 4) peak time tp
- delay time td 5)
- peak overshoot Mp 6)
- Sketch Bode plot for transfer function C) 0

$$(s) = \frac{100}{100}$$

$$G(S) = \frac{1000}{(1+0.1S)(1+0.001S)}$$

Determine

- Phase Margin 1)
- 2) Gain Margin
- Comment on stability of system 3)

16

**SLR-FM-234** 

Set

Instr	uctior	<b>າຣ:</b> 1	<ol> <li>Q. No. 1 is compulsory and it s answer book.</li> </ol>	hould	be solved in first 30 minute	s in
			<ol> <li>Figures to the right indicate full</li> <li>Assume suitable data if necess</li> </ol>	mark ary.	S.	
			MCQ/Objective Ty	/pe Q	Questions	
Dura	tion: 3	0 Mi	inutes			Marks: 14
Q.1	Choose the correct alternatives from the options and rewrite the					
	1)	A <sub>f</sub> = a) b) c) d)	1+(R <sub>f</sub> /R₁) represents open loop gain of Non-Inverting closed loop gain of Non-Invertin open loop gain of Inverting Amp none of these	Ampl g Am lifier	ifier olifier	
	2)	For a) c)	summing amplifier ratio of R <sub>f</sub> /R s less than one zero	should b) d)	d be greater than one one	
	3)	Intr a) c)	oduction of negative feedback makes gain infinite stabilizes gain	b) d)	make bandwidth infinite none of these	
	4)	Gai a) c)	in bandwidth product of IC741 is 10 MHz Infinite	b) d)	 1MHz 1KHz	
	5)	Vo <sub>c</sub> a) c)	<sub>cm</sub> /V <sub>cm</sub> represents CMRR A <sub>cm</sub>	b) d)	open loop voltage gain voltage rejection ratio	
	6)	Ma a) c)	ximum value of $d V_o/dt$ is called voltage ratio slew rate	b) d)	 voltage rate transient response	
	7)	The till i a)	e gain of the basic differentiator ir t touches open loop response True	ncreas  b)	ses with increase in frequen False	су
	8)	Wh a) b) c)	at is the purpose of the op amp v Impedance matching to alleviate filter losses Easy adjustment over a wide fre	vithin equen	active filters? cy range	

S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronic & Telecommunication Engineering** LINEAR INTEGRATED CIRCUIT

d) all of above

### For peak detector which of the following is true \_\_\_\_\_. 9)

- a)  $CR_d \leq T/10$  $CR_L \ge 10T$ b)
- c) Both a and b d) None of these

Seat No.

Day & Date: Tuesday, 26-11-2019

Time: 02:30 PM To 05:30 PM

Max. Marks: 70

Set Ρ

- 10) circuit converts irregular shape into square wave or pulse.
  - a) Schmitt Trigger

- b) Clamper
- c) Peak Detector
- d) Window Detector

Set P

- Which of the following circuit is called as dc inserter? 11)
  - b) Schmitt trigger
  - a) dc amplifier c) Clampers d) Zero crossing Detector
- Which block of PLL provides flywheel action for smoothing as dc inserter? 12)
  - b) VCO
  - c) Phase Detector d) Level Shifter
- Active filters offers below advantages over passive filters \_\_\_\_ 13) .
  - a) Flexibility in design
- Gain adjustment b) None of these
- c) Both a and b d)
- For a quadrature oscillator, If fo = 1.59KHz and C=0.01 µF then R=? 14)
  - a) 10KΩ c) 1KΩ

a) Filter

- 100 KΩ b)
- 15.9 KΩ d)

# Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronic & Telecommunication Engineering LINEAR INTEGRATED CIRCUIT

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

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

# Q.2 Attempt any four.

- a) Consider an inverting amplifier with feedback with  $R_f=5K\Omega$ ,  $R_1=100\Omega$ ,  $A_f=50$ , slew rate=0.5 V/µsec. Calculate Vp.
- **b)** Prove that for a Non-inverting amplifier with feedback,  $f_f = f_o(1+AB)$
- c) For an AC inverting amplifier, derive equation for lower cut-off frequency.
- d) Explain V to I converter with floating load.
- e) Design a Inverting amplifier using op-amp 741 for closed loop gain of 7.

# Q.3 Attempt any two.

- a) Derive the  $I_{CEQ}$  and  $V_{CEQ}$  for DIBO differential amplifier.
- **b)** Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1 KHz.
- c) State any six specifications of IC 741.

# Section – II

# Q.4 Attempt any four.

- a) Explain positive clipper using op amp.
- **b)** Explain Log amplifier.
- c) Draw and explain Sample and Hold Circuit.
- d) Draw and explain quadrature oscillator.
- e) Design a Second order low pass Butterworth filter with  $f_{H}$ = 1.5KHz.

# Q.5 Attempt any two.

- a) Draw and explain Wein bridge Oscillator with a proof of  $f_0 = 1/2\pi RC$ .
- **b)** Explain Frequency Multiplier using PLL.
- c) Explain Half Wave precision rectifier with waveforms.



Max. Marks: 56

16

12

16

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronic & Telecommunication Engineering** LINEAR INTEGRATED CIRCUIT

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- What is the purpose of the op amp within active filters? 1)
  - Impedance matching a)
    - to alleviate filter losses b)
    - c) Easy adjustment over a wide frequency range
    - d) all of above
- For peak detector which of the following is true 2)
  - a)  $CR_d \leq T/10$ b)
  - c) Both a and b d)
- 3) circuit converts irregular shape into square wave or pulse.
  - a) Schmitt Trigger b)
  - c) Peak Detector d)
- Which of the following circuit is called as dc inserter? 4)
  - a) dc amplifier b)
  - c) Clampers d)
- Which block of PLL provides flywheel action for smoothing as dc inserter? 5)
  - a) Filter b) VCO
  - c) Phase Detector d) Level Shifter

Active filters offers below advantages over passive filters \_ 6)

- a) Flexibility in design
- b) Gain adjustment d) None of these
- 7) For a quadrature oscillator, If fo = 1.59KHz and C= $0.01 \mu$ F then R=?
  - 10KΩ 100 KΩ a) b) c)
    - 1ΚΩ d) 15.9 KΩ
- $A_{f}=1+(R_{f}/R_{1})$  represents 8)

c) Both a and b

- a) open loop gain of Non-Inverting Amplifier
- b) closed loop gain of Non-Inverting Amplifier
- c) open loop gain of Inverting Amplifier
- d) none of these

Set



Max. Marks: 70

Marks: 14

14

**SLR-FM-235** 

Seat No.

- CR1>10T
- None of these
- Clamper
- Window Detector
- Schmitt trigger
- Zero crossing Detector

			SLR-FM-235
			Set Q
9)	For summing amplifier ratio of R <sub>f</sub> /R s a) less than one c) zero	should b) d)	be greater than one one
10)	Introduction of negative feedback a) makes gain infinite c) stabilizes gain	b) d)	make bandwidth infinite none of these
11)	Gain bandwidth product of IC741 is a) 10 MHz c) Infinite	b) d)	 1MHz 1KHz
12)	Vo <sub>cm</sub> /V <sub>cm</sub> represents a) CMRR c) A <sub>cm</sub>	b) d)	open loop voltage gain voltage rejection ratio
13)	Maximum value of d V <sub>o</sub> /dt is called a) voltage ratio c) slew rate	b) d)	 voltage rate transient response
14)	The gain of the basic differentiator in till it touches open loop response	ncreas	ses with increase in frequency

a) True b) False

# Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronic & Telecommunication Engineering LINEAR INTEGRATED CIRCUIT

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

**Instructions:** 1) All questions are compulsory.

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### Section – I

# Q.2 Attempt any four.

- a) Consider an inverting amplifier with feedback with  $R_f=5K\Omega$ ,  $R_1=100\Omega$ ,  $A_f=50$ , slew rate=0.5 V/µsec. Calculate Vp.
- **b)** Prove that for a Non-inverting amplifier with feedback,  $f_f = f_o(1+AB)$
- c) For an AC inverting amplifier, derive equation for lower cut-off frequency.
- d) Explain V to I converter with floating load.
- e) Design a Inverting amplifier using op-amp 741 for closed loop gain of 7.

# Q.3 Attempt any two.

- a) Derive the  $I_{CEQ}$  and  $V_{CEQ}$  for DIBO differential amplifier.
- **b)** Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1 KHz.
- c) State any six specifications of IC 741.

# Section – II

# Q.4 Attempt any four.

- a) Explain positive clipper using op amp.
- **b)** Explain Log amplifier.
- c) Draw and explain Sample and Hold Circuit.
- d) Draw and explain quadrature oscillator.
- e) Design a Second order low pass Butterworth filter with  $f_{H}$ = 1.5KHz.

# Q.5 Attempt any two.

- a) Draw and explain Wein bridge Oscillator with a proof of  $f_0 = 1/2\pi RC$ .
- **b)** Explain Frequency Multiplier using PLL.
- c) Explain Half Wave precision rectifier with waveforms.



Max. Marks: 56

12

16

16

			Electronic & Telecommu LINEAR INTEGRA	inica ATEC	tion Engineering CIRCUIT	
Day Time	& Date : 02:3	e: Tu 0 PN	esday, 26-11-2019 I To 05:30 PM		N	lax. Marks: 70
Instr	uctio	n <b>s:</b> 1 2 3	) Q. No. 1 is compulsory and it s answer book. ) Figures to the right indicate ful ) Assume suitable data if necess	hould I mark sary.	be solved in first 30 min s.	utes in
			MCQ/Objective Ty	ype (	Questions	
Dura	ition: 3	BO Mi	nutes			Marks: 14
Q.1	Cho	ose t	he correct alternatives from the	ne op	tions and rewrite the	14
	1)	Vo <sub>c</sub> a) c)	⊶ <sub>m</sub> /V <sub>cm</sub> represents CMRR A <sub>cm</sub>	b) d)	open loop voltage gain voltage rejection ratio	
	2)	Max a) c)	kimum value of $d V_o/dt$ is called voltage ratio slew rate	b) d)	 voltage rate transient response	
	3)	The till it a)	e gain of the basic differentiator in touches open loop response True	ncrea b)	ses with increase in freq False	uency
	4)	Wha) b) c) d)	at is the purpose of the op amp Impedance matching to alleviate filter losses Easy adjustment over a wide fre all of above	within equen	active filters?	
	5)	For a) c)	peak detector which of the follow $CR_d \le T/10$ Both a and b	wing i b) d)	s true CR∟≥10T None of these	
	6)	a) c)	circuit converts irregular sha Schmitt Trigger Peak Detector	ape in b) d)	to square wave or pulse Clamper Window Detector	
	7)	Wh a) c)	ich of the following circuit is calle dc amplifier Clampers	ed as b) d)	dc inserter? Schmitt trigger Zero crossing Detector	
	8)	Wh a) c)	ich block of PLL provides flywhe Filter Phase Detector	el act b) d)	ion for smoothing as dc i VCO Level Shifter	nserter?
	9)	Acti a) c)	ve filters offers below advantage Flexibility in design Both a and b	es ove b) d)	er passive filters Gain adjustment None of these	

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019

Seat No.

SLR-FM-235

Set R

None of these

10) For a quadrature oscillator, If fo = 1.59KHz and C=0.01 µF then R=?

- b) 100 KΩ
- 1KΩ d) 15.9 KΩ
- $A_f=1+(R_f/R_1)$  represents \_\_\_\_ 11)

10KΩ

a)

C)

- a) open loop gain of Non-Inverting Amplifier
- b) closed loop gain of Non-Inverting Amplifier
- c) open loop gain of Inverting Amplifier
- d) none of these
- For summing amplifier ratio of R<sub>f</sub>/R should be \_\_\_\_ 12)
  - a) less than one b) greater than one
  - d) c) zero one

#### 13) Introduction of negative feedback a) makes gain infinite b) make bandwidth infinite

- c) stabilizes gain d) none of these
- Gain bandwidth product of IC741 is \_\_\_\_ 14)
  - a) 10 MHz b) 1MHz
    - c) Infinite
- d) 1KHz

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**SLR-FM-235** 

Set R

# Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronic & Telecommunication Engineering LINEAR INTEGRATED CIRCUIT

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

**Instructions:** 1) All questions are compulsory.

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# Section – I

# Q.2 Attempt any four.

- a) Consider an inverting amplifier with feedback with  $R_f=5K\Omega$ ,  $R_1=100\Omega$ ,  $A_f=50$ , slew rate=0.5 V/µsec. Calculate Vp.
- **b)** Prove that for a Non-inverting amplifier with feedback,  $f_f = f_o(1+AB)$
- c) For an AC inverting amplifier, derive equation for lower cut-off frequency.
- d) Explain V to I converter with floating load.
- e) Design a Inverting amplifier using op-amp 741 for closed loop gain of 7.

# Q.3 Attempt any two.

- a) Derive the  $I_{CEQ}$  and  $V_{CEQ}$  for DIBO differential amplifier.
- **b)** Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1 KHz.
- c) State any six specifications of IC 741.

# Section – II

# Q.4 Attempt any four.

- a) Explain positive clipper using op amp.
- **b)** Explain Log amplifier.
- c) Draw and explain Sample and Hold Circuit.
- d) Draw and explain quadrature oscillator.
- e) Design a Second order low pass Butterworth filter with  $f_{H}$ = 1.5KHz.

# Q.5 Attempt any two.

- a) Draw and explain Wein bridge Oscillator with a proof of  $f_0 = 1/2\pi RC$ .
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- c) Explain Half Wave precision rectifier with waveforms.



Max. Marks: 56

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12

12

Seat	
No.	

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronic & Telecommunication Engineering** LINEAR INTEGRATED CIRCUIT

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.	

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- Assume suitable data if necessary.

# **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

- circuit converts irregular shape into square wave or pulse. 1) b) Clamper
  - Schmitt Trigger a)
  - c) Peak Detector d) Window Detector
- 2) Which of the following circuit is called as dc inserter?
  - a) dc amplifier b) Schmitt trigger
  - c) Clampers d) Zero crossing Detector
- Which block of PLL provides flywheel action for smoothing as dc inserter? 3)
  - a) Filter VCO b)
  - c) Phase Detector Level Shifter d)
- 4) Active filters offers below advantages over passive filters \_
  - a) Flexibility in design c) Both a and b
- Gain adjustment b) None of these
- d)
- For a quadrature oscillator, If fo = 1.59KHz and C=0.01 µF then R=? 5) 100 KΩ a) 10KΩ b)
  - c) 1KΩ 15.9 KΩ d)
- $A_{f}=1+(R_{f}/R_{1})$  represents 6)
  - a) open loop gain of Non-Inverting Amplifier
  - b) closed loop gain of Non-Inverting Amplifier
  - open loop gain of Inverting Amplifier c)
  - d) none of these

7) For summing amplifier ratio of R<sub>f</sub>/R should be

- less than one greater than one a) b)
  - C) zero d) one
- Introduction of negative feedback 8)
  - b) makes gain infinite make bandwidth infinite a)
  - stabilizes gain none of these c) d)
- Gain bandwidth product of IC741 is \_\_\_ 9) 1MHz a) 10 MHz b)
  - C) Infinite d) 1KHz



Set

Max. Marks: 70

Marks: 14

10) Vo<sub>cm</sub>/V<sub>cm</sub> represents \_\_\_\_\_. a) CMRR b) open loop voltage gain d) voltage rejection ratio c) A<sub>cm</sub> 11) Maximum value of  $d V_0/dt$  is called \_\_\_\_\_ voltage rate b) a) voltage ratio c) slew rate transient response d) 12) The gain of the basic differentiator increases with increase in frequency till it touches open loop response \_ a) True b) False 13) What is the purpose of the op amp within active filters? a) Impedance matching b) to alleviate filter losses c) Easy adjustment over a wide frequency range d) all of above

# 14) For peak detector which of the following is true \_\_\_\_\_.

a)  $CR_d \leq T/10$ 

- b)  $CR_{L} \ge 10T$
- c) Both a and b d) None of these

SLR-FM-235 Set S

# Seat No.

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronic & Telecommunication Engineering** LINEAR INTEGRATED CIRCUIT

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

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

### Q.2 Attempt any four.

- Consider an inverting amplifier with feedback with  $R_f=5K\Omega$ ,  $R_1=100\Omega$ , a) A<sub>f</sub>=50, slew rate=0.5 V/µsec. Calculate Vp.
- Prove that for a Non-inverting amplifier with feedback,  $f_f = f_o(1+AB)$ b)
- For an AC inverting amplifier, derive equation for lower cut-off frequency. c)
- Explain V to I converter with floating load. d)
- Design a Inverting amplifier using op-amp 741 for closed loop gain of 7. e)

#### Q.3 Attempt any two.

- Derive the  $I_{CEQ}$  and  $V_{CEQ}$  for DIBO differential amplifier. a)
- b) Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1 KHz.
- State any six specifications of IC 741. c)

### Section – II

### Q.4 Attempt any four.

- Explain positive clipper using op amp. a)
- Explain Log amplifier. b)
- Draw and explain Sample and Hold Circuit. c)
- Draw and explain quadrature oscillator. d)
- Design a Second order low pass Butterworth filter with  $f_{H}$ = 1.5KHz. e)

### Q.5 Attempt any two.

- Draw and explain Wein bridge Oscillator with a proof of  $f_0 = 1/2\pi RC$ . a)
- Explain Frequency Multiplier using PLL. b)
- Explain Half Wave precision rectifier with waveforms. c)



Max. Marks: 56

16

12

12

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Assume suitable data if necessary

# MCQ/Objective Type Questions

Q.1	<b>Cho</b> 1)	se the correct alternatives from the options and rewrite the sentence.14f x[4-n] is derived from the x[n] by which transformation?14a) Reversal and shiftb) reversal onlyb) Scalingd) scaling and shifting
	2)	Aathematically unit impulse is a derivative of Unit step b) unit ramp Unit parabola d) None
	3)	Vith u(n) as unit step function, u(n)-u(n-2) is.u) $\delta(n)$ b) $\delta(n) + \delta(n-1)$ u) $\delta(n) + \delta(n-2)$ d) $\delta(n) + \delta(n+1)$
	4)	Which system is non-causal system? $y(t) = x(t+1)$ b) $y(t) = x(t-1)$ $y(t) = x(t) + c$ d) $y(t) = x(t) - c$
	5)	Find the convolution of $x(n) = \{1,2,3\} h(n) = \{1,2\}.$ a) $\{1,2,5,6\}$ b) $\{0,4,3,1\}$ b) $\{1,4,7,6\}$ d) $\{4,2,3,1\}$
	6)	Time transformations are ) Time shifting b) Time scaling c) Time reversal d) All
	7)	Find the time period of $x(t) = sin(50t)$ a) $25\pi$ b) $50$ b) $\pi/2$ d) $\pi/25$
	8)	<ul> <li>For the successful reconstruction of signals</li> <li>Sampling frequency must be equal to the message signal</li> <li>Sampling frequency must be greater to the message signal</li> <li>Sampling frequency must be less to the message signal</li> <li>Sampling frequency must be greater than or equal to the message signal</li> </ul>
	9)	Vhat is the z-transform of the finite duration signal $n(n) = \{2,4,5,7,0,1\}?$ $n(n) = \{2,4,5$

Max. Marks: 70

Marks: 14

Set

Seat No.

Duration: 30 Minutes

Set P

- 10) If x(n)=u(n)-u(n-4) then ROC is \_\_\_\_\_.
  - a) Entire Z plane
  - b) Entire Z plane, expect z = 0
  - c) Entire Z plane, expect  $z = \infty$
  - d) Entire Z plane, expect z = 0 and expect  $z = \infty$
- 11) Which of the following justifies the linearity property of z-transform?  $[x(n) \leftrightarrow X(z)].$ 
  - a)  $ax(n) + by(n) \leftrightarrow aX(z)bY(z)$
  - c)  $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$
- b)  $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$
- d)  $ax(n)by(n) \leftrightarrow aX(z)bY(z)$
- 12) Duality property is \_\_\_\_\_ a)  $X(t) \leftrightarrow 2\pi x(-w)$

c)  $X(at) \leftrightarrow 1/a X(w/a)$ 

- b)  $X(-t) \leftrightarrow 2x(-w)$
- d)  $(-it) X(t) \leftrightarrow 2x\pi(-w)$
- Fourier transform of Sgn (t) is \_\_\_\_ 13) b) -2/jw a) 1 c) 2/jw d) 0
- 14) What does the first term 'a0' in the below stated expression of a line spectrum indicate?
  - $x(t) = a0 + a1 \cos w0t + a2 \cos 2 w0t + \dots + b1 \sin w0 t + b2 \sin w0 t + \dots$
  - a) DC component
- b) Fundamental component
- c) Second harmonic component d) All of the above

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

**Instructions:** 1) All questions are compulsory.

2) Assume suitable data if necessary

### Section – I

# **Q.2** Attempt any three of the following questions.

- a) For the signal shown in fig. find following.
  - 1) x(2t+2)
  - 2) x(3-t/2)



c) Find the convolution using graphical method  $x(n) = \{1, 2, 3, 3\} h(n) = \{1, 2, 2\}$ .

d) Find the step response if the impulse response is  $e^{-2t} u(t)$ .

# Q.3 Attempt any two of the following questions.

- a) Explain the transformations on independent variables with examples.
- b) Determine following system is  $y(t) = even \{x(t)\}$ .
  - 1) Causal/non-causal
  - 2) Linear/Non-linear
  - 3) Time Variant- invariant

c) Find even and odd part of the given signal  $x(n) = \{3,2,1,1,1,2,1,1\}$ .

### Section – II

# Q.4 Attempt any three of the following questions.

- a) Define Aliasing error. Explain how it can be avoided?
- b) Find Z-transform with its ROC of  $x(n)=(2)^n \cdot u(n)+(3)^n \cdot u(-n-1)$ .
- c) Find inverse Z- transform  $X(Z) = \frac{Z^2 + Z}{(Z-1)^2}$ , Right sided sequence using partial fraction expansion method.
- d) Find Fourier transform of  $x(t) = COSW_0 t$ .

# Q.5 Attempt any two of the following questions.

- a) Consider the analog signal
  - $X(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$
  - 1) What is Nyquist sampling rate?
  - 2) The signal is sampled using fs =5000 Hz. What is DT signal?
- b) Determine the sequence x(n) associated with Z.T given below using power series method.

$$X[Z] = \frac{Z^2 + Z}{Z^3 - 3Z^2 + 3Z - 1}; |z| > 1 \text{ ROC}$$





Max. Marks: 56

12

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16



c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and  $T_0 = \pi$ 


S.E. (Part – II	) (New) (CBCS) E

## xamination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

5)

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No.

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

- 1) For the successful reconstruction of signals .
  - Sampling frequency must be equal to the message signal a)
  - Sampling frequency must be greater to the message signal b)
  - Sampling frequency must be less to the message signal c)
  - Sampling frequency must be greater than or equal to the message d) signal

#### 2) What is the z-transform of the finite duration signal .

- $x(n) = \{2,4,5,7,0,1\}?$
- a)  $2 + 4z + 5z^{2} + 7z^{3} + z^{4}$ c)  $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ b)  $2 + 4z + 5z^{2} + 7z^{3} + z^{5}$ d)  $2z^{2} + 4z + 5 + 7z^{-1} + z^{-3}$
- 3) If x(n)=u(n)-u(n-4) then ROC is \_\_\_\_\_.
  - a) Entire Z plane
  - Entire Z plane, expect z = 0b)
  - Entire Z plane, expect  $z = \infty$ c)
  - d) Entire Z plane, expect z = 0 and expect  $z = \infty$

### Which of the following justifies the linearity property of z-transform? 4) $[x(n) \leftrightarrow X(z)].$

- $ax(n) + by(n) \leftrightarrow aX(z)bY(z)$ a)
- $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$ C)
- Duality property is  $X(t) \leftrightarrow 2\pi x(-w)$ a)
  - $X(at) \leftrightarrow 1/a X(w/a)$ C)
- b)  $X(-t) \leftrightarrow 2x(-w)$
- d)  $(-jt) X(t) \leftrightarrow 2x\pi(-w)$

b)  $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$ 

d)  $ax(n)by(n) \leftrightarrow aX(z)bY(z)$ 

- Fourier transform of Sgn (t) is \_\_\_\_ 6) b) -2/jw a) 1
  - C) 2/jw d) 0
- 7) What does the first term 'a0' in the below stated expression of a line spectrum indicate?

 $x(t) = a0 + a1 \cos w0t + a2 \cos 2 w0t + \dots + b1 \sin w0 t + b2 \sin w0 t + \dots$ 

- a) DC component b) Fundamental component
- Second harmonic component d) All of the above c)

Marks: 14

Max. Marks: 70

Set Q

8)	lf x[ a) c)	4-n] is derived from the x[n] by w Reversal and shift Scaling	/hich b) d)	transformation? reversal only scaling and shifting
9)	Mat a) c)	hematically unit impulse is a der Unit step Unit parabola	ivativ b) d)	ve of unit ramp None
10)	Witl a) c)	n u(n) as unit step function, u(n)- $\delta(n)$ $\delta(n) + \delta(n - 2)$	u(n-: b) d)	2) is. $\delta(n) + \delta(n - 1)$ $\delta(n) + \delta(n + 1)$
11)	Whi a) c)	ich system is non-causal system y(t) = x(t + 1) y(t) = x(t) + c	? b) d)	y(t) = x(t - 1) y(t) = x(t) - c
12)	Fino a) c)	d the convolution of $x(n) = \{1,2,3,1,2,5,6\}$ $\{1,4,7,6\}$	3} h( b) d)	$n) = \{1,2\}. \\ \{0,4,3,1\} \\ \{4,2,3,1\}$
13)	Tim a) c)	e transformations are Time shifting Time reversal	b) d)	Time scaling All
14)	Fino a) c)	the time period of $x(t) = sin(50)$ $25\pi$ $\pi/2$	0t) _ b) d)	50 π/25

Set Q

## S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

**Instructions:** 1) All questions are compulsory.

2) Assume suitable data if necessary

### Section – I

## Q.2 Attempt any three of the following questions.

- a) For the signal shown in fig. find following.
  - 1) x(2t+2)
  - 2) x(3-t/2)



c) Find the convolution using graphical method  $x(n) = \{1,2,3,3\} h(n) = \{1,2,2\}$ .

d) Find the step response if the impulse response is  $e^{-2t} u(t)$ .

## Q.3 Attempt any two of the following questions.

- a) Explain the transformations on independent variables with examples.
- b) Determine following system is y(t) = even {x(t)}.
  - 1) Causal/non-causal
  - 2) Linear/Non-linear
  - 3) Time Variant- invariant

c) Find even and odd part of the given signal  $x(n) = \{3,2,1,1,1,2,1,1\}$ .

### Section – II

## Q.4 Attempt any three of the following questions.

- a) Define Aliasing error. Explain how it can be avoided?
- b) Find Z-transform with its ROC of  $x(n)=(2)^n \cdot u(n)+(3)^n \cdot u(-n-1)$ .
- c) Find inverse Z- transform  $X(Z) = \frac{Z^2 + Z}{(Z-1)^2}$ , Right sided sequence using partial fraction expansion method.
- d) Find Fourier transform of  $x(t) = COSW_0 t$ .

## Q.5 Attempt any two of the following questions.

- a) Consider the analog signal
  - $X(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$
  - 1) What is Nyquist sampling rate?
  - 2) The signal is sampled using fs =5000 Hz. What is DT signal?
- b) Determine the sequence x(n) associated with Z.T given below using power series method.

$$X[Z] = \frac{Z^2 + Z}{Z^3 - 3Z^2 + 3Z - 1}; |z| > 1 \text{ ROC}$$





12

Max. Marks: 56

16



c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and  $T_0 = \pi$ 



## S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

**Duration: 30 Minutes** 

Seat

No.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary

## **MCQ/Objective Type Questions**

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14 Find the convolution of  $x(n) = \{1,2,3\} h(n) = \{1,2\}.$ 1) a) {1,2,5,6} b) {0,4,3,1}
  - c)  $\{1,4,7,6\}$ d)  $\{4,2,3,1\}$
  - Time transformations are \_\_\_\_\_. 2) a) Time shifting b) Time scaling c) Time reversal d) All
  - 3) Find the time period of x(t) = sin(50t)b) 50 25π a) d) π/25 c)  $\pi/2$

4) For the successful reconstruction of signals \_\_\_\_\_

- Sampling frequency must be equal to the message signal a)
- Sampling frequency must be greater to the message signal b)
- Sampling frequency must be less to the message signal c)
- Sampling frequency must be greater than or equal to the message d) signal
- What is the z-transform of the finite duration signal \_\_\_\_\_. 5)
  - $x(n) = \{2,4,5,7,0,1\}?$
  - a)  $2 + 4z + 5z^2 + 7z^3 + z^4$ c)  $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ b)  $2 + 4z + 5z^2 + 7z^3 + z^5$ c)  $2z^2 + 4z + 5z^{-1} + z^{-3}$
- 6) If x(n)=u(n)-u(n-4) then ROC is \_\_\_\_\_.
  - a) Entire Z plane
  - b) Entire Z plane, expect z = 0
  - Entire Z plane, expect  $z = \infty$ c)
  - Entire Z plane, expect z = 0 and expect  $z = \infty$ d)

### 7) Which of the following justifies the linearity property of z-transform? $[x(n) \leftrightarrow X(z)].$

- a)  $ax(n) + by(n) \leftrightarrow aX(z)bY(z)$
- c)  $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$
- 8) Duality property is \_\_\_\_\_
  - a)  $X(t) \leftrightarrow 2\pi x(-w)$ c)  $X(at) \leftrightarrow 1/a X(w/a)$
- b)  $X(-t) \leftrightarrow 2x(-w)$
- d)  $(-it) X(t) \leftrightarrow 2x\pi(-w)$
- Fourier transform of Sgn (t) is \_\_\_\_ 9)
  - b) -2/jw a) 1 d) 0
    - C) 2/jw



Max. Marks: 70

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Marks: 14

- b)  $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$ d)  $ax(n)by(n) \leftrightarrow aX(z)bY(z)$



- 10) What does the first term 'a0' in the below stated expression of a line spectrum indicate?
  - $x(t) = a0 + a1 \cos w0t + a2 \cos 2 w0t + \dots + b1 \sin w0 t + b2 \sin w0 t + \dots$

a) DC component b) Fundamental component

- Second harmonic component d) All of the above c)
- 11) If x[4-n] is derived from the x[n] by which transformation?
  - Reversal and shift b) reversal only a) Scaling C)
    - d) scaling and shifting
- 12) Mathematically unit impulse is a derivative of \_\_\_\_
  - b) unit ramp Unit step a)
  - C) Unit parabola d) None
- 13) With u(n) as unit step function, u(n)-u(n-2) is.
  - a) δ(n) b)  $\delta(n) + \delta(n-1)$ c)  $\delta(n) + \delta(n-2)$ d)  $\delta(n) + \delta(n+1)$
- 14) Which system is non-causal system?
  - a) y(t) = x(t+1)b) y(t) = x(t-1)
  - c) y(t) = x(t) + cd) y(t) = x(t) - c

## S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary

### Section – I

## Q.2 Attempt any three of the following questions.

- For the signal shown in fig. find following. a)
  - 1) x(2t+2)
  - 2) x(3-t/2)



Find the convolution using graphical method  $x(n) = \{1,2,3,3\} h(n) = \{1,2,2\}$ . C)

Find the step response if the impulse response is  $e^{-2t}$  u(t). d)

#### Q.3 Attempt any two of the following questions.

- Explain the transformations on independent variables with examples. a)
- Determine following system is  $y(t) = even \{x(t)\}$ . b)
  - 1) Causal/non-causal
  - 2) Linear/Non-linear
  - 3) Time Variant- invariant

Find even and odd part of the given signal  $x(n) = \{3,2,1,1,1,2,1,1\}$ . C)

### Section – II

#### Q.4 Attempt any three of the following questions.

- Define Aliasing error. Explain how it can be avoided? a)
- Find Z-transform with its ROC of  $x(n)=(2)^n \cdot u(n)+(3)^n \cdot u(-n-1)$ . b)
- Find inverse Z- transform  $X(Z) = \frac{Z^2 + Z}{(Z-1)^2}$ , Right sided sequence using C) partial fraction expansion method.
- Find Fourier transform of  $x(t) = COSW_0 t$ . d)

#### Attempt any two of the following questions. Q.5

- Consider the analog signal a)
  - $X(t) = 3 \cos 2000 \pi t + 5 \sin 6000 \pi t + 10 \cos 1000 \pi t$
  - 1) What is Nyquist sampling rate?
  - 2) The signal is sampled using fs =5000 Hz. What is DT signal?
- Determine the sequence x(n) associated with Z.T given below using power b) series method.

$$X[Z] = \frac{Z^2 + Z}{Z^3 - 3Z^2 + 3Z - 1}; |z| > 1 \text{ ROC}$$

Max. Marks: 56

12

16

12

16

## Seat No.





c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and  $T_0 = \pi$ 



## S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

a) Entire Z plane

2) Assume suitable data if necessary

If x(n)=u(n)-u(n-4) then ROC is \_\_\_\_\_.

## **MCQ/Objective Type Questions**

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

- b) Entire Z plane, expect z = 0Entire Z plane, expect  $z = \infty$ c) d) Entire Z plane, expect z = 0 and expect  $z = \infty$ 2) Which of the following justifies the linearity property of z-transform?  $[x(n) \leftrightarrow X(z)].$ a)  $ax(n) + by(n) \leftrightarrow aX(z)bY(z)$ b)  $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$  $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$ d)  $ax(n)by(n) \leftrightarrow aX(z)bY(z)$ c) Duality property is 3) a)  $X(t) \leftrightarrow 2\pi x(-w)$ b)  $X(-t) \leftrightarrow 2x(-w)$ c)  $X(at) \leftrightarrow 1/a X(w/a)$ d)  $(-jt) X(t) \leftrightarrow 2x\pi(-w)$ Fourier transform of Sgn (t) is \_\_\_\_ 4) b) -2/jw a) 1 C) 2/jw d) 0 What does the first term 'a0' in the below stated expression of a line 5) spectrum indicate?  $x(t) = a0 + a1 \cos w0t + a2 \cos 2 w0t + \dots + b1 \sin w0 t + b2 \sin w0 t + \dots$ DC component b) Fundamental component a) Second harmonic component d) All of the above C) If x[4-n] is derived from the x[n] by which transformation? 6) a) Reversal and shift b) reversal only c) Scaling d) scaling and shifting 7) Mathematically unit impulse is a derivative of \_\_\_\_\_ a) Unit step b) unit ramp c) Unit parabola d) None With u(n) as unit step function, u(n)-u(n-2) is. 8) b)  $\delta(n) + \delta(n-1)$ a) δ(n) c)  $\delta(n) + \delta(n-2)$ d)  $\delta(n) + \delta(n+1)$ Which system is non-causal system? 9)
  - a) y(t) = x(t+1)b) y(t) = x(t-1)
  - c) y(t) = x(t) + cd) y(t) = x(t) - c

SLR-FM-236

Set

Max. Marks: 70

**Duration: 30 Minutes** 

1)

No.

Q.1

Marks: 14

Set S

- 10) Find the convolution of  $x(n) = \{1,2,3\} h(n) = \{1,2\}.$ 
  - a)  $\{1,2,5,6\}$ b) {0,4,3,1}
  - c)  $\{1,4,7,6\}$ d) {4,2,3,1}
- 11) Time transformations are \_\_\_\_
  - b) Time scaling a) Time shifting
  - c) Time reversal d) All
- 12) Find the time period of x(t) = sin(50t)
  - b) 50 a) 25π
  - c)  $\pi/2$ d) π/25
- 13) For the successful reconstruction of signals
  - Sampling frequency must be equal to the message signal a)
  - Sampling frequency must be greater to the message signal b)
  - Sampling frequency must be less to the message signal C)
  - Sampling frequency must be greater than or equal to the message d) signal
- 14) What is the z-transform of the finite duration signal \_\_\_\_\_.
  - $x(n) = \{2,4,5,7,0,1\}?$

- a)  $2 + 4z + 5z^2 + 7z^3 + z^4$ c)  $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ b)  $2 + 4z + 5z^2 + 7z^3 + z^5$ c)  $2z^2 + 4z + 5z^{-1} + z^{-3}$

# S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

SIGNALS AND SYSTEMS Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary

## Section – I

## Q.2 Attempt any three of the following questions.

- a) For the signal shown in fig. find following.
  - 1) x(2t+2)

Seat No.

2) x(3-t/2)



c) Find the convolution using graphical method  $x(n) = \{1, 2, 3, 3\} h(n) = \{1, 2, 2\}$ .

d) Find the step response if the impulse response is  $e^{-2t} u(t)$ .

## Q.3 Attempt any two of the following questions.

- a) Explain the transformations on independent variables with examples.
- b) Determine following system is y(t)= even {x(t)}.
  - 1) Causal/non-causal
  - 2) Linear/Non-linear
  - 3) Time Variant- invariant
- c) Find even and odd part of the given signal  $x(n) = \{3,2,1,1,1,2,1,1\}$ .

## Section – II

## Q.4 Attempt any three of the following questions.

- a) Define Aliasing error. Explain how it can be avoided?
- b) Find Z-transform with its ROC of  $x(n)=(2)^n . u(n)+(3)^n . u(-n-1)$ .
- c) Find inverse Z- transform  $X(Z) = \frac{Z^2 + Z}{(Z-1)^2}$ , Right sided sequence using partial fraction expansion method.
- d) Find Fourier transform of  $x(t) = COSW_0 t$ .

## **Q.5** Attempt any two of the following questions.

- a) Consider the analog signal
  - $X(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$
  - 1) What is Nyquist sampling rate?
  - 2) The signal is sampled using fs =5000 Hz. What is DT signal?
- b) Determine the sequence x(n) associated with Z.T given below using power series method.

$$X[Z] = \frac{Z^2 + Z}{Z^3 - 3Z^2 + 3Z - 1}; |z| > 1 \text{ ROC}$$

Max. Marks: 56

12

16

12





c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and  $T_0 = \pi$ 



C/m	d)	All of these	
Itage applied across the c	capacito	r is increased, the capacitance	
 reases nains constant	b) d)	Decreases becomes infinity	
itative relation between in	duced e	mf and rate of change of flux	
xwell's law	b)	Stoke's law	
nz's law	d)	Faraday's law	

Seat No.

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 05:30 PM

**Duration: 30 Minutes** 

5)

8)

c)

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 allowed.

## MCQ/Objective Type Questions

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

- A point is obtained by intersection of \_\_\_\_\_ in spherical co-ordinates. 3 planes 2 planes and circle a) b)
  - plane, circle and a cone d) none of these c)
- 2) Which of the following is meaningless combination?

		•	•		
a)	grad div			b)	curl div
c)	curl grad			d)	none o

- curl grad d) none of these
- 3) If the direction of Coulomb's Force on a unit charge is  $\overline{ax}$ , the direction of electric field intensity is \_\_\_\_\_.
  - b) a) ay -ax d) c) āz  $\overline{ax}$
- 4) If pair of +ve & -ve charges of 2C separated by distance  $3\mu m$  then the magnitude of dipole moment is \_\_\_\_
  - $2C \mu m$ b) 1.5 C - ma)
  - $6C \mu m$ C) d)  $3C - \mu m$
  - If E is a vector then  $\nabla$ .  $\nabla \times E$  is \_\_\_\_\_ a) 1 b) 0 doesn't exist C) d)  $\infty$
  - The unit of Electric field Intensity is \_
- 6) b) a) N/C V-m
  - J-C C)
- 7) If the vo value \_\_
  - a) inc
  - c) rem
    - A quanti linkage i
    - a) Ма
      - Ler





Max. Marks: 70

Marks: 14

# 9) What is the flux density of a magnetic field whose flux is 3000 $\mu$ Wb and cross-sectional area is 0.25 m<sup>2</sup>?

- a) 12,000 μT
- b) 83330 T
- c) 0 T
- d) insufficient information provided
- 10) When the speed at which a conductor is moved through a magnetic field is increased, the induced voltage \_\_\_\_\_
  - a) increases b) Decreases
  - c) remains constant d) reaches zero
- 11) One of this is NOT the source of magnetic fields \_\_\_\_\_.
  - a) a DC current in wire
  - b) a permanent magnet
  - c) an accelerated charge
  - d) an electric field linearly changing with time
- 12) Two identical coaxial circular coils carry the same current I but in opposite directions. The magnitude of magnetic field B at a point midway between coils is \_\_\_\_\_.
  - a) Zero
  - b) same as that produced by one coil
  - c) twice that produced by one coil
  - d) half of that produced by one coil
- 13) Poynting vector is \_\_\_\_\_.
  - a)  $P = \overline{E} \cdot \overline{H}$  b)  $P = 1/2(\overline{E} \times \overline{H})$
  - c)  $P = \overline{E} \times \overline{H}$  d)  $P = \nabla . (\overline{E} \times \overline{H})$
- 14) Two media are characterized as \_\_\_\_

1)  $\mu r = 1$ ,  $\epsilon r = 4$  and  $\sigma = 0$ Where:  $\epsilon r = relative permittivity$ ,  $\mu r = relative permeability$  and  $\sigma = conductivity$ The ratio of the intrinsic impedance of the media 2 to media 1 is \_\_\_\_\_.

2:2

- a) 2:1 b) 1:2
- c) 1:1 d)

**SLR-FM-237** 

Set

Max. Marks: 56

## Seat No.

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicates full marks.

## Section – I

## Q.2 Attempt any three.

- a) State and prove Gauss' law.
- **b)** Determine the total charge inside the volume indicated by  $\rho v = 4x y z^2$  if  $0 \le \rho \le 2, 0 \le \Phi \le \frac{\pi}{2}, 0 \le z \le 3$
- c) A point charge of 6 nC located at origin in free space. Find  $V_{PQ}$  if point P is located at (0.2,-0.4, 0.4) & Q is at (-0.5, 1, -1). Also find  $V_P$  if V = 20 V at point Q.
- d) Electric dipole located at origin in free space has dipole moment  $\overline{p} = 3 \overline{ax} 2 \overline{ay} + \overline{aznC-m}$ . Find V at P(2, 3, 4).

## Q.3 Attempt any two.

- a) Find  $\overline{E}$  at P(1,5,2) in free space due to
  - 1) A point charge of  $6 \mu C$  is located at Q(0,0,1).
  - 2) uniform line charge of 180 nC/m lies along x axis.
  - 3) a sheet charge of 20 nC/m<sup>2</sup> is placed at y = 3.
- **b)** Derive the equation for  $\overline{E}$  due to infinite sheet charge placed in z=0 plane.
- c) Establish the boundary condition for dielectric boundary having permeability  $\varepsilon_1$  and  $\varepsilon_2$ .

## Section – II

## Q.4 Attempt any three.

- a) State and explain Ampere's circuital law.
- **b)** Write a note on antenna field zones.
- c) In a medium if  $\overline{E} = Em \sin \propto \cos(wt \beta z) \overline{ay} V/m$  find  $\overline{H}$ .
- d) If magnetic field intensity in a region is  $\overline{H} = x^2 \overline{ax} + 2yz \overline{ay} x^2 \overline{az}$  find current density at point P(2,3,4).

## Q.5 Attempt any two.

- a) Derive Maxwell's equations in point and integral form for time varying field.
- b) Evaluate both sides of Stroke's theorem for the field  $\overline{H} = \left(\frac{y^2z}{x}\right)\overline{ax} + \left(0.5 \frac{y^2z^2}{x^2}\right)\overline{az} \text{ crossing the square surface in the plane } y = 2$ 
  - bounded by x = z = 1 and x = z = 2.
- c) With a neat diagram explain Broadside, End fire and Yagi-Uda array.

12

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## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-12-2019 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 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

- A quantitative relation between induced emf and rate of change of flux
  - linkage is known as .
  - Maxwell's law a) C) Lenz's law
- Stoke's law b) d) Faraday's law
- 2) What is the flux density of a magnetic field whose flux is 3000 µWb and cross-sectional area is  $0.25 \text{ m}^2$ ?
  - 12,000 μT a)
  - 83330 T b)
  - 0 T c)
  - insufficient information provided d)
- 3) When the speed at which a conductor is moved through a magnetic field is increased, the induced voltage
  - increases b) Decreases a) remains constant d) reaches zero c)
- One of this is NOT the source of magnetic fields \_\_\_\_\_. 4)
  - a DC current in wire a)
  - a permanent magnet b)
  - c) an accelerated charge
  - an electric field linearly changing with time d)
- 5) Two identical coaxial circular coils carry the same current I but in opposite directions. The magnitude of magnetic field B at a point midway between coils is
  - a) Zero
  - b) same as that produced by one coil
  - twice that produced by one coil c)
  - half of that produced by one coil d)
- 6) Poynting vector is \_\_\_\_\_.
  - $P = \overline{E} \cdot \overline{H}$  $P = 1/2(\overline{E} \times \overline{H})$ a) b)  $\mathbf{P} = \nabla . \left( \overline{\mathbf{E}} \times \overline{\mathbf{H}} \right)$  $\mathbf{P} = \overline{\mathbf{E}} \times \overline{\mathbf{H}}$ d) C)



Max. Marks: 70



				Set Q
7)	Two 1) Whe The a) c)	media are characterized as $\_\_$ $\mu r = 1, \epsilon r = 4$ and $\sigma = 0$ ere: $\epsilon r$ = relative permittivity, $\mu r$ = ratio of the intrinsic impedance of 2:1 1:1	 2) = rela of the b) d)	$\mu r = 4$ , $\epsilon r = 4$ and $\sigma = 0$ tive permeability and $\sigma =$ conductivity media 2 to media 1 is 1:2 2:2
8)	A po a) c)	pint is obtained by intersection of 3 planes plane, circle and a cone	b) d)	_ in spherical co-ordinates. 2 planes and circle none of these
9)	Whi a) c)	ch of the following is meaningles grad div curl grad	s con b) d)	nbination? curl div none of these
10)	lf the elec a) c)	e direction of Coulomb's Force o tric field intensity is $\overline{ay}$ $\overline{az}$	n a u b) d)	hit charge is $\overline{ax}$ , the direction of $-\overline{ax}$ $\overline{ax}$
11)	lf pa mag a) c)	ir of +ve & -ve charges of 2C s initude of dipole moment is 2 C - $\mu m$ 6 C - $\mu m$	epara  b) d)	tted by distance $3\mu m$ then the 1.5 C - m $3 C - \mu m$
12)	lf E a) c)	is a vector then $\nabla . \nabla \times E$ is 1 $\infty$	 b) d)	0 doesn't exist
13)	The a) c)	unit of Electric field Intensity is _ N/C J-C/m	b) d)	V-m All of these
14)	lf the valu a)	e voltage applied across the cap e increases	acitor b)	is increased, the capacitance Decreases
	c)	remains constant	d)́	becomes infinity

## Seat No.

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicates full marks.

## Section – I

## Q.2 Attempt any three.

- a) State and prove Gauss' law.
- **b)** Determine the total charge inside the volume indicated by  $\rho v = 4x y z^2$  if  $0 \le \rho \le 2, 0 \le \Phi \le \frac{\pi}{2}, 0 \le z \le 3$
- c) A point charge of 6 nC located at origin in free space. Find  $V_{PQ}$  if point P is located at (0.2,-0.4, 0.4) & Q is at (-0.5, 1, -1). Also find  $V_P$  if V = 20 V at point Q.
- d) Electric dipole located at origin in free space has dipole moment  $\overline{p} = 3 \overline{ax} 2 \overline{ay} + \overline{aznC-m}$ . Find V at P(2, 3, 4).

## Q.3 Attempt any two.

- a) Find  $\overline{E}$  at P(1,5,2) in free space due to
  - 1) A point charge of  $6 \mu C$  is located at Q(0,0,1).
  - 2) uniform line charge of 180 nC/m lies along x axis.
  - 3) a sheet charge of 20 nC/m<sup>2</sup> is placed at y = 3.
- **b)** Derive the equation for  $\overline{E}$  due to infinite sheet charge placed in z=0 plane.
- c) Establish the boundary condition for dielectric boundary having permeability  $\varepsilon_1$  and  $\varepsilon_2$ .

## Section – II

## Q.4 Attempt any three.

- a) State and explain Ampere's circuital law.
- **b)** Write a note on antenna field zones.
- c) In a medium if  $\overline{E} = Em \sin \propto \cos(wt \beta z) \overline{ay} V/m$  find  $\overline{H}$ .
- d) If magnetic field intensity in a region is  $\overline{H} = x^2 \overline{ax} + 2yz \overline{ay} x^2 \overline{az}$  find current density at point P(2,3,4).

## Q.5 Attempt any two.

- a) Derive Maxwell's equations in point and integral form for time varying field.
- **b)** Evaluate both sides of Stroke's theorem for the field  $\overline{H} = \left(\frac{y^2z}{x}\right)\overline{ax} + \left(0.5 \frac{y^2z^2}{x^2}\right)\overline{az} \text{ crossing the square surface in the plane } y = 2$ 
  - bounded by x = z = 1 and x = z = 2.
- c) With a neat diagram explain Broadside, End fire and Yagi-Uda array.

Max. Marks: 56

16

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Sea No.	t		Set	R						
	T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & PADIATING SYSTEM									
Dav	LL & Dat	LECTRO MAGNETIC ENGINEERING & RADIATING SYST	<b>EIVI</b> (Mark	s· 70						
Time	e: 02:3	30 PM To 05:30 PM	. marix	5.70						
Insti	uctio	ons: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes book.	s in ans	wer						
		2) Use of non-programmable calculator is allowed.								
Dura	tion: '	MCQ/Objective Type Questions	Mark	s• 1∕I						
0 1	Cho	oose the correct alternatives from the ontions and rewrite the sen	tence	5. 14 14						
Q. 1	1)	If E is a vector then $\nabla . \nabla \times E$ is	tence.	14						
		a) 1 b) 0 c) ∞ d) doesn't exist								
	2)	The unit of Electric field Intensity is								
	-)	a) N/C b) V-m								
	-	c) J-C/m d) All of these								
	3)	If the voltage applied across the capacitor is increased, the capacita value	nce							
		a) increases b) Decreases								
		c) remains constant d) becomes infinity								
	4)	A quantitative relation between induced emf and rate of change of fill linkage is known as	ux							
		a) Maxwell's law b) Stoke's law								
	<b>_</b> )	c) Lenz's law d) Faraday's law	l							
	5)	cross-sectional area is 0.25 m <sup>2</sup> ?	and							
		a) 12,000 μT								
		b) 83330 T c) 0 T								
		d) insufficient information provided								
	6)	When the speed at which a conductor is moved through a magnetic	field							
		a) increases b) Decreases								
		c) remains constant d) reaches zero								
	7)	One of this is NOT the source of magnetic fields								
		b) a permanent magnet								
		<ul> <li>an accelerated charge</li> <li>an electric field linearly changing with time</li> </ul>								

# SLR-FM-237 Set R

				Set R
8)	Two direc coils a) b) c) d)	o identical coaxial circular coils ca ctions. The magnitude of magne is Zero same as that produced by one twice that produced by one coil half of that produced by one co	arry th tic fie coil i	ne same current I but in opposite Id B at a point midway between
9)	Poy a) c)	nting vector is $P = \overline{E} \cdot \overline{H}$ $P = \overline{E} \times \overline{H}$	b) d)	$P = 1/2(\overline{E} \times \overline{H})$ $P = \nabla . (\overline{E} \times \overline{H})$
10)	Two 1) Whe The a) c)	media are characterized as $\_$ $\mu r = 1, \epsilon r = 4 \text{ and } \sigma = 0$ ere: $\epsilon r = \text{relative permittivity, } \mu r = 1$ ratio of the intrinsic impedance 2:1 1:1	2) = rela of the b) d)	$\mu r = 4$ , $\epsilon r = 4$ and $\sigma = 0$ tive permeability and $\sigma =$ conductivity media 2 to media 1 is 1:2 2:2
11)	A po a) c)	bint is obtained by intersection of 3 planes plane, circle and a cone	f b) d)	_ in spherical co-ordinates. 2 planes and circle none of these
12)	Whi a) c)	ch of the following is meaningles grad div curl grad	ss cor b) d)	nbination? curl div none of these
13)	lf the elec a) c)	e direction of Coulomb's Force c tric field intensity is $\overline{ay}$ $\overline{az}$	on a u b) d)	nit charge is $\overline{ax}$ , the direction of $-\overline{ax}$ $\overline{ax}$
14)	lf pa mag a)	air of $+ve \& -ve$ charges of 2C s gnitude of dipole moment is $2 C - \mu m$	epara  b)	ated by distance $3\mu m$ then the 1.5 C - m
	U)	οι – μπ	u)	$s_{\rm L} - \mu m$

## Seat No.

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicates full marks.

## Section – I

#### Q.2 Attempt any three.

- a) State and prove Gauss' law.
- Determine the total charge inside the volume indicated by b)  $\rho v = 4x \text{ y } z^2 \text{ if } 0 \le \rho \le 2, 0 \le \Phi \le \frac{\pi}{2}, 0 \le z \le 3$
- A point charge of 6 nC located at origin in free space. Find V<sub>PQ</sub> if point P is c) located at (0.2,-0.4, 0.4) & Q is at (-0.5, 1, -1). Also find  $V_P$  if V = 20 V at point Q.
- d) Electric dipole located at origin in free space has dipole moment  $\overline{p} = 3 \overline{ax} - 2 \overline{ay} + \overline{aznC-m}$ . Find V at P(2, 3, 4).

#### Q.3 Attempt any two.

- Find  $\overline{E}$  at P(1,5,2) in free space due to a)
  - 1) A point charge of 6  $\mu$ C is located at Q(0,0,1).
  - uniform line charge of 180 nC/m lies along x axis. 2)
  - a sheet charge of 20 nC/m<sup>2</sup> is placed at y = 3. 3)
- Derive the equation for  $\overline{E}$  due to infinite sheet charge placed in z=0 plane. b)
- c) Establish the boundary condition for dielectric boundary having permeability  $\varepsilon_1$  and  $\varepsilon_2$ .

## Section – II

#### Q.4 Attempt any three.

- State and explain Ampere's circuital law. a)
- Write a note on antenna field zones. b)
- In a medium if  $\overline{E} = Em \sin \propto \cos(wt \beta z) \overline{ay} V/m$  find  $\overline{H}$ . C)
- If magnetic field intensity in a region is  $\overline{H} = x^2 \overline{ax} + 2yz \overline{ay} x^2 \overline{az}$  find d) current density at point P(2,3,4).

### Q.5 Attempt any two.

- Derive Maxwell's equations in point and integral form for time varying field. a)
- Evaluate both sides of Stroke's theorem for the field b)
  - $\overline{H} = \left(\frac{y^2 z}{z}\right) \overline{ax} + \left(0.5 \frac{y^2 z^2}{z^2}\right) \overline{az}$  crossing the square surface in the plane y = 2bounded by x = z = 1 and x = z = 2.
- C) With a neat diagram explain Broadside, End fire and Yagi-Uda array.

Max. Marks: 56

16

12

16

Seat	
No.	

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 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 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) When the speed at which a conductor is moved through a magnetic field is increased, the induced voltage \_\_\_\_\_
    - a) increases b) Decreases
    - c) remains constant d) reaches zero
  - 2) One of this is NOT the source of magnetic fields \_\_\_\_\_.
    - a) a DC current in wire
    - b) a permanent magnet
    - c) an accelerated charge
    - d) an electric field linearly changing with time
  - Two identical coaxial circular coils carry the same current I but in opposite directions. The magnitude of magnetic field B at a point midway between coils is \_\_\_\_\_.
    - a) Zero
    - b) same as that produced by one coil
    - c) twice that produced by one coil
    - d) half of that produced by one coil
  - Poynting vector is \_\_\_\_\_.
    - a)  $P = \overline{E} \cdot \overline{H}$ c)  $P = \overline{E} \times \overline{H}$ d)  $P = \frac{1}{2}(\overline{E} \times \overline{H})$
    - c)  $P = \overline{E} \times \overline{H}$  d)  $P = \nabla (\overline{E} \times \overline{H})$
  - Two media are characterized as \_ 5)  $\mu r = 1$ ,  $\epsilon r = 4$  and  $\sigma = 0$ 2)  $\mu r = 4$ ,  $\epsilon r = 4$  and  $\sigma = 0$ 1) Where:  $\varepsilon r$  = relative permittivity,  $\mu r$  = relative permeability and  $\sigma$  = conductivity The ratio of the intrinsic impedance of the media 2 to media 1 is \_\_\_\_\_. a) 2:1 b) 1:2 1:1 d) 2:2 C)
  - 6) A point is obtained by intersection of \_\_\_\_\_ in spherical co-ordinates.
    - a) 3 planes b) 2 planes and circle
      - c) plane, circle and a cone d) none of these
  - 7) Which of the following is meaningless combination?
    - a) grad div b) curl div
    - c) curl grad d) none of these

STEM

Max. Marks: 70

Marks: 14

			Set	S
8)	If the direction of Coulomb's Force electric field intensity is a) ay c) az	on a u b) d)	unit charge is $\overline{ax}$ , the direction of $-\overline{ax}$ $\overline{ax}$	
9)	If pair of $+ve \& -ve$ charges of 2C magnitude of dipole moment is a) $2 C - \mu m$ c) $6 C - \mu m$	separ  b) d)	ated by distance $3\mu m$ then the 1.5 C - m $3 C - \mu m$	
10)	If E is a vector then $\nabla . \nabla \times E$ is a) 1 c) $\infty$	 b) d)	0 doesn't exist	
11)	The unit of Electric field Intensity is a) N/C c) J-C/m	b) d)	 V-m All of these	
12)	If the voltage applied across the ca value a) increases c) remains constant	pacito b) d)	r is increased, the capacitance Decreases becomes infinity	
13)	A quantitative relation between indu linkage is known as a) Maxwell's law c) Lenz's law	uced e b) d)	emf and rate of change of flux Stoke's law Faraday's law	
4 4				

- What is the flux density of a magnetic field whose flux is 3000  $\mu Wb$  and cross-sectional area is 0.25  $m^2?$ 14)
  - 12,000 μT 83330 T a)
  - b)
  - 0 T C)
  - insufficient information provided d)

Seat	
No.	

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicates full marks.

## Section – I

#### Attempt any three. Q.2

- a) State and prove Gauss' law.
- Determine the total charge inside the volume indicated by b)  $\rho v = 4x \text{ y } z^2 \text{ if } 0 \le \rho \le 2, 0 \le \Phi \le \frac{\pi}{2}, 0 \le z \le 3$
- A point charge of 6 nC located at origin in free space. Find V<sub>PQ</sub> if point P is c) located at (0.2,-0.4, 0.4) & Q is at (-0.5, 1, -1). Also find  $V_P$  if V = 20 V at point Q.
- d) Electric dipole located at origin in free space has dipole moment  $\overline{p} = 3 \overline{ax} - 2 \overline{ay} + \overline{aznC-m}$ . Find V at P(2, 3, 4).

#### Q.3 Attempt any two.

- Find  $\overline{E}$  at P(1,5,2) in free space due to a)
  - 1) A point charge of  $6 \mu C$  is located at Q(0,0,1).
  - uniform line charge of 180 nC/m lies along x axis. 2)
  - a sheet charge of 20 nC/m<sup>2</sup> is placed at y = 3. 3)
- Derive the equation for  $\overline{E}$  due to infinite sheet charge placed in z=0 plane. b)
- C) Establish the boundary condition for dielectric boundary having permeability  $\varepsilon_1$  and  $\varepsilon_2$ .

## Section – II

#### Q.4 Attempt any three.

- State and explain Ampere's circuital law. a)
- Write a note on antenna field zones. b)
- In a medium if  $\overline{E} = Em \sin \propto \cos(wt \beta z) \overline{ay} V/m$  find  $\overline{H}$ . c)
- If magnetic field intensity in a region is  $\overline{H} = x^2 \overline{ax} + 2yz \overline{ay} x^2 \overline{az}$  find d) current density at point P(2,3,4).

### Q.5 Attempt any two.

- Derive Maxwell's equations in point and integral form for time varying field. a)
- Evaluate both sides of Stroke's theorem for the field b)  $\overline{H} = \left(\frac{y^2 z}{x}\right) \overline{ax} + \left(0.5 \frac{y^2 z^2}{x^2}\right) \overline{az} \text{ crossing the square surface in the plane } y = 2$ 
  - bounded by x = z = 1 and x = z = 2.
- C) With a neat diagram explain Broadside, End fire and Yagi-Uda array.

Max. Marks: 56

16

12

12

# T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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) Assume suitable data whenever necessary.
- 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. 14

- Which of the following is not a unit of information? 1)
  - Bit b) Decit a)
  - c) Nat d) Hz
- The phase difference between two possible transmitted signals in BPSK is \_\_\_\_. 2)
  - a) П b) П/2
  - c)  $\Pi/4$ d) Π/8

3) According to Shannon's theorem the output from any source of rate R can be coded and transmitted over a channel of capacity C with the condition that

- a) C<R b) C>R  $C < R^2$  $C > R^2$ c) d)
- 4) Frequency shift keying is used mostly in
  - Radio transmission a) c)
    - Telephony
- Companding is used in PCM to \_\_\_\_ 5)
  - Reduce bandwidth a)
  - d) Get almost uniform S/N ratio Increase S/N ratio C)
- Duo binary signaling makes use of \_ 6) b) A matched filter
  - Two binary a)
  - Controlled ISI introduction c)
  - Equalizers are used for \_\_\_\_\_
    - a) Frame synchronization
    - Carrier synchronization C)
- d) Minimizing ISI

b)

- 8) Which of the following is more vulnerable to noise?
  - Binary PSK a) c) 8-ary PSK

b) Quadrature PSK d) 16-ary PSK

9) QAM has

7)

- Variation of phase only with four values of phases a)
- Variation of amplitude only with four values of phases b)
- Variation of phase as well as amplitude C)
- d) None of these

Marks: 14

- d) None of these

b) Reduce power

d) Correlation receiver

Symbol synchronization

b) Telegraphy

Max. Marks: 70



Set



- Set P
- 10) For a BPSK scheme, the bit error probability is given by \_\_\_\_\_.

a) 
$$\frac{1}{2} erfc \sqrt{\frac{E_b}{2\eta_0}}$$
  
b)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{2\eta_0}}$   
c)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{\eta_0}}$   
d)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{\eta_0}}$ 

- 11) A rectangular pulse of duration T is applied to a filter matched to the input. The output of filter is \_\_\_\_\_.
  - a) Rectangular pulse of duration T
  - b) Rectangular pulse of duration 2T
  - c) Triangular pulse
  - d) Sine function
- 12) Which of the following operations is not performed in a Multicarrier communication transmitter?
  - a) Add Cyclic prefix
- b) Serial to parallel convert
- c) Fast Fourier Transform
- d) Autocorrelation
- 13) The minimum distance of a block code is defined as the \_\_\_\_\_
  - a) the number of bits in which two successive code words differ
  - b) the smallest hamming distance between any pair of code words
  - c) the minimum weight of any of the code words
  - d) the distance which can detect and correct one bit error
- 14) A linear block code has following property \_\_\_\_\_.
  - a) It is always systematic code
  - b) When two valid codewords are added, the resultant is also a valid codeword
  - c) It can detect one bit error and correct two bit errors
  - d) both a) and b) above

Set

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019

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) Assume suitable data whenever necessary.

## Section – I

## Q.2 Answer any Four.

- a) An event has six possible outcomes with probabilities 1/2, 1/4, 1/8, 1/16, 1/32 and 1/32 respectively. Find the entropy of the system. Also find the rate of information if there are16 outcomes per second.
- **b)** Explain symbol synchronization technique.
- c) Compare BPSK and BFSK modulation schemes.
- d) With block diagram explain working of DPCM.
- e) Explain the operation of a scrambler and un scrambler.

## Q.3 Answer any Two.

a) Apply Huffman coding procedure for the following message ensemble. Calculate the efficiency. Also find redundancy .Take M = 2.

[X] =	[ X1	X2	Х3	X4	X5	X6	X7 ]
[P] =	[ 0.4	0.2	0.12	0.08	0.08	0.08	0.04]

**b)** Find the mutual information and channel capacity of the channel shown in fig below.

Given p(x1)=0.6 and p(x2)=0.4

frequency.





Max. Marks: 56

12

### Section – II

## Q.4 Attempt any four questions.

- a) Explain the operation of QPSK transmitter. What is the advantage of offset QPSK over non offset QPSK?
- **b)** Explain the operation of an integrate and dump receiver.
- c) Write a note on FFT based multicarrier system.
- d) Explain the operation of a carrier recovery system.
- e) Explain the operation of a syndrome decoder for a (n,k) block code.

## Q.5 Attempt any two questions.

- a) Explain the operation of M-ary PSK transmitter and Receiver. Also draw the phasor diagram and comment on the trade off between value of M and the noise performance.
- **b)** What is matched filter? Derive the expression for impulse response of matched filter and explain with the example.
- c) The error control code has the following Generator matrix.

				0			
	[1	0	0	0	1	1	0]
c –	0	1	0	0	0	1	1
u –	0	0	1	0	1	0	1
	0	0	0	1	1	1	1

Determine.

- 1) All code words
- 2) Error detection and error correction capabilities.
- 3) Decode the received codeword [1 1 1 1 0 1 0]

16

## **SLR-FM-238**

Set

### 10

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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) Assume suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

2)

Seat No.

Marks: 14

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

- 1) Which of the following is more vulnerable to noise?
  - **Binary PSK** a)
  - 8-ary PSK C)

- b) Quadrature PSK d) 16-ary PSK
- QAM has
- a) Variation of phase only with four values of phases
- Variation of amplitude only with four values of phases b)
- Variation of phase as well as amplitude c)
- None of these d)
- For a BPSK scheme, the bit error probability is given by 3)
  - b)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{2\eta_0}}$ a)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{2\eta_0}}$ d)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{\eta_0}}$ c)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{\eta_0}}$
- A rectangular pulse of duration T is applied to a filter matched to the input. 4) The output of filter is
  - Rectangular pulse of duration T a)
  - Rectangular pulse of duration 2T b)
  - c) Triangular pulse
  - Sine function d)
- 5) Which of the following operations is not performed in a Multicarrier communication transmitter?
  - Add Cyclic prefix b) Serial to parallel convert a) c) Fast Fourier Transform d) Autocorrelation
- 6) The minimum distance of a block code is defined as the
  - the number of bits in which two successive code words differ a)
  - the smallest hamming distance between any pair of code words b)
  - the minimum weight of any of the code words C)
  - the distance which can detect and correct one bit error d)



Max. Marks: 70



	Set Q
7)	<ul> <li>A linear block code has following property</li> <li>a) It is always systematic code</li> <li>b) When two valid codewords are added, the resultant is also a valid codeword</li> <li>c) It can detect one bit error and correct two bit errors</li> <li>d) both a) and b) above</li> </ul>
8)	Which of the following is not a unit of information? a) Bit b) Decit c) Nat d) Hz
9)	The phase difference between two possible transmitted signals in BPSK isa) Πb) Π/2c) Π/4d) Π/8
10)	According to Shannon's theorem the output from any source of rate R can be coded and transmitted over a channel of capacity C with the condition that a) $C < R$ b) $C > R$ c) $C < R^2$ d) $C > R^2$
11)	Frequency shift keying is used mostly in a) Radio transmission b) Telegraphy c) Telephony d) None of these
12)	Companding is used in PCM toa) Reduce bandwidthb) Reduce powerc) Increase S/N ratiod) Get almost uniform S/N ratio
13)	Duo binary signaling makes use of a) Two binary b) A matched filter c) Controlled ISI introduction d) Correlation receiver
14)	Equalizers are used for a) Frame synchronization b) Symbol synchronization

- c) Carrier synchronization
- d) Minimizing ISI

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019

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) Assume suitable data whenever necessary.

## Section – I

## Q.2 Answer any Four.

- a) An event has six possible outcomes with probabilities 1/2, 1/4, 1/8, 1/16, 1/32 and 1/32 respectively. Find the entropy of the system. Also find the rate of information if there are16 outcomes per second.
- **b)** Explain symbol synchronization technique.
- c) Compare BPSK and BFSK modulation schemes.
- d) With block diagram explain working of DPCM.
- e) Explain the operation of a scrambler and un scrambler.

 $\mathbf{x}$ 

x2

## Q.3 Answer any Two.

a) Apply Huffman coding procedure for the following message ensemble. Calculate the efficiency. Also find redundancy .Take M = 2.

[X] =	[ X1	X2	X3	X4	X5	X6	X7 ]
[P] =	[ 0.4	0.2	0.12	0.08	0.08	0.08	0.04]

0.8

0.2

y2

**b)** Find the mutual information and channel capacity of the channel shown in fig below.

Given p(x1)=0.6 and p(x2)=0.4



PCM system for 128 quantization levels and an 8 KHz sampling frequency.

33

0.7

Max. Marks: 56

12

16

Set Q

### Section – II

## Q.4 Attempt any four questions.

- a) Explain the operation of QPSK transmitter. What is the advantage of offset QPSK over non offset QPSK?
- **b)** Explain the operation of an integrate and dump receiver.
- c) Write a note on FFT based multicarrier system.
- d) Explain the operation of a carrier recovery system.
- e) Explain the operation of a syndrome decoder for a (n,k) block code.

## Q.5 Attempt any two questions.

- a) Explain the operation of M-ary PSK transmitter and Receiver. Also draw the phasor diagram and comment on the trade off between value of M and the noise performance.
- **b)** What is matched filter? Derive the expression for impulse response of matched filter and explain with the example.
- c) The error control code has the following Generator matrix.

				0			
	[1	0	0	0	1	1	0]
c –	0	1	0	0	0	1	1
u –	0	0	1	0	1	0	1
	0	0	0	1	1	1	1

Determine.

- 1) All code words
- 2) Error detection and error correction capabilities.
- 3) Decode the received codeword [1 1 1 1 0 1 0]

16

12

## **SLR-FM-238**

Set Q

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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) Assume suitable data whenever necessary.
- 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. 14

b)

- 1) Companding is used in PCM to \_\_\_\_\_
  - Reduce bandwidth a) Increase S/N ratio c) d)
- Duo binary signaling makes use of \_ 2)
  - Two binary a)
  - Controlled ISI introduction C)
- 3) Equalizers are used for \_
  - a) Frame synchronization
  - c) Carrier synchronization
- 4) Which of the following is more vulnerable to noise?
  - a) Binary PSK

8-ary PSK

b) Quadrature PSK d) 16-ary PSK

5) QAM has

c)

- Variation of phase only with four values of phases a)
- Variation of amplitude only with four values of phases b)
- Variation of phase as well as amplitude c)
- None of these d)

#### For a BPSK scheme, the bit error probability is given by \_\_\_\_\_. 6)

- b)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{2\eta_0}}$ a)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{2\eta_0}}$ c)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{\eta_0}}$ d)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{\eta_0}}$
- 7) A rectangular pulse of duration T is applied to a filter matched to the input. The output of filter is \_\_\_\_
  - a) Rectangular pulse of duration T
  - b) Rectangular pulse of duration 2T
  - Triangular pulse c)
  - Sine function d)

- Symbol synchronization b)
- d) Minimizing ISI

b) Reduce power

A matched filter

d) Correlation receiver

Max. Marks: 70

Marks: 14





			S	Set	R
Whi com	ch of the following operations is munication transmitter?	not p	performed in a Multicarrier		
a) c)	Add Cyclic prefix Fast Fourier Transform	b) d)	Serial to parallel convert Autocorrelation		
The a) b) c) d)	minimum distance of a block co the number of bits in which two the smallest hamming distance the minimum weight of any of th the distance which can detect a	de is succ betw e co nd c	s defined as the cessive code words differ veen any pair of code words ode words orrect one bit error		
A lin a) b) c) d)	ear block code has following pro It is always systematic code When two valid codewords are codeword It can detect one bit error and co both a) and b) above	opert adde orrec	y ed, the resultant is also a valid ct two bit errors		
Whi a) c)	ch of the following is not a unit o Bit Nat	f info b) d)	ormation? Decit Hz		
The a) c)	phase difference between two p $\Pi$ $\Pi/4$	ossi b) d)	ble transmitted signals in BPSI $\Pi/2$ $\Pi/8$	K is _	

13) According to Shannon's theorem the output from any source of rate R can be coded and transmitted over a channel of capacity C with the condition that \_\_\_\_\_.

a)	C <r< th=""><th>b)</th><th>C&gt;R</th></r<>	b)	C>R
c)	C <r<sup>2</r<sup>	d)	C>R <sup>2</sup>

- Frequency shift keying is used mostly in \_ 14)
  - \_. b) Telegraphy
  - a) Radio transmission c) Telephony
- d) None of these

- 8)

9)

10)

11)

12)

## Seat No.

## T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data whenever necessary.

## Section – I

## Q.2 Answer any Four.

- a) An event has six possible outcomes with probabilities 1/2, 1/4, 1/8, 1/16, 1/32 and 1/32 respectively. Find the entropy of the system. Also find the rate of information if there are16 outcomes per second.
- **b)** Explain symbol synchronization technique.
- c) Compare BPSK and BFSK modulation schemes.
- d) With block diagram explain working of DPCM.
- e) Explain the operation of a scrambler and un scrambler.

## Q.3 Answer any Two.

a) Apply Huffman coding procedure for the following message ensemble. Calculate the efficiency. Also find redundancy .Take M = 2.

[X] =	[ X1	X2	X3	X4	X5	X6	X7 ]
[P] =	[ 0.4	0.2	0.12	0.08	0.08	0.08	0.04]

**b)** Find the mutual information and channel capacity of the channel shown in fig below.

Given p(x1)=0.6 and p(x2)=0.4

frequency.



 $x_{1}$  0.8  $y_{1}$  0.2  $y_{2}$   $y_{2}$   $y_{2}$ 

Max. Marks: 56

12

### Section – II

## Q.4 Attempt any four questions.

- a) Explain the operation of QPSK transmitter. What is the advantage of offset QPSK over non offset QPSK?
- **b)** Explain the operation of an integrate and dump receiver.
- c) Write a note on FFT based multicarrier system.
- d) Explain the operation of a carrier recovery system.
- e) Explain the operation of a syndrome decoder for a (n,k) block code.

## Q.5 Attempt any two questions.

- a) Explain the operation of M-ary PSK transmitter and Receiver. Also draw the phasor diagram and comment on the trade off between value of M and the noise performance.
- **b)** What is matched filter? Derive the expression for impulse response of matched filter and explain with the example.
- c) The error control code has the following Generator matrix.

			J -			-	
	[1	0	0	0	1	1	0]
<i>G</i> =	0	1	0	0	0	1	1
	0	0	1	0	1	0	1
	0	0	0	1	1	1	1

Determine.

- 1) All code words
- 2) Error detection and error correction capabilities.
- 3) Decode the received codeword [1 1 1 1 0 1 0]

16

12

## **SLR-FM-238**

Set R
# T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Monday, 09-12-2019 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) Assume suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

#### **MCQ/Objective Type Questions**

PRINCIPLES OF DIGITAL COMMUNICATION

**Duration: 30 Minutes** 

Seat No.

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

- 1) For a BPSK scheme, the bit error probability is given by \_
  - b)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{2\eta_0}}$ a)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{2\eta_0}}$ d)  $\frac{1}{2} erfc \frac{1}{2} \sqrt{\frac{E_b}{\eta_0}}$ c)  $\frac{1}{2} erfc \sqrt{\frac{E_b}{\eta_0}}$
- 2) A rectangular pulse of duration T is applied to a filter matched to the input. The output of filter is
  - a) Rectangular pulse of duration T
  - Rectangular pulse of duration 2T b)
  - Triangular pulse c)
  - Sine function d)
- Which of the following operations is not performed in a Multicarrier 3) communication transmitter?
  - Add Cyclic prefix a) b) Serial to parallel convert
  - Fast Fourier Transform d) Autocorrelation c)
- 4) The minimum distance of a block code is defined as the \_\_\_\_\_
  - the number of bits in which two successive code words differ a)
  - b) the smallest hamming distance between any pair of code words
  - the minimum weight of any of the code words C)
  - the distance which can detect and correct one bit error d)
- A linear block code has following property \_\_\_\_ 5)
  - It is always systematic code a)
  - When two valid codewords are added, the resultant is also a valid b) codeword
  - It can detect one bit error and correct two bit errors C)
  - d) both a) and b) above
- Which of the following is not a unit of information? 6)
  - a) Bit b) Decit
  - Nat c) d) Hz

Max. Marks: 70

Marks: 14



**SLR-FM-238** 

- The phase difference between two possible transmitted signals in BPSK is .
- a)  $\Pi$  b)  $\Pi/2$
- с) П/4 d) П/8
- According to Shannon's theorem the output from any source of rate R can be coded and transmitted over a channel of capacity C with the condition that \_\_\_\_\_.
  - a) C < Rc)  $C < R^2$ b) C > Rd)  $C > R^2$

#### 9) Frequency shift keying is used mostly in \_\_\_\_

- a) Radio transmission b) Telegraphy
- c) Telephony d) None of these

#### 10) Companding is used in PCM to \_\_\_\_\_

- a) Reduce bandwidth
- c) Increase S/N ratio
- Duo binary signaling makes use of
- a) Two binary
- c) Controlled ISI introduction
- 12) Equalizers are used for \_\_\_\_\_
  - a) Frame synchronization
  - c) Carrier synchronization
- b) Symbol synchronization

d) Get almost uniform S/N ratio

d) Minimizing ISI

b) Reduce power

b) A matched filter

d) Correlation receiver

- 13) Which of the following is more vulnerable to noise?
  - a) Binary PSK c) 8-ary PSK
- b) Quadrature PSK
- d) 16-ary PSK

14) QAM has \_\_\_\_

7)

11)

- a) Variation of phase only with four values of phases
- b) Variation of amplitude only with four values of phases
- c) Variation of phase as well as amplitude
- d) None of these

Page 15 of 16

## SLR-FM-238

Seat	
No.	

### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data whenever necessary.

#### Section – I

#### Q.2 Answer any Four.

- a) An event has six possible outcomes with probabilities 1/2, 1/4, 1/8, 1/16, 1/32 and 1/32 respectively. Find the entropy of the system. Also find the rate of information if there are16 outcomes per second.
- **b)** Explain symbol synchronization technique.
- c) Compare BPSK and BFSK modulation schemes.
- d) With block diagram explain working of DPCM.
- e) Explain the operation of a scrambler and un scrambler.

#### Q.3 Answer any Two.

a) Apply Huffman coding procedure for the following message ensemble. Calculate the efficiency. Also find redundancy .Take M = 2.

[X] =	[ X1	X2	X3	X4	X5	X6	X7 ]
[P] =	[ 0.4	0.2	0.12	0.08	0.08	0.08	0.04]

**b)** Find the mutual information and channel capacity of the channel shown in fig below.

Given p(x1)=0.6 and p(x2)=0.4



 $x1 \xrightarrow{0.8} y1$  y1 0.2 0.2 0.2 0.2 0.2 y2

Max. Marks: 56

12

#### Section – II

#### Q.4 Attempt any four questions.

- a) Explain the operation of QPSK transmitter. What is the advantage of offset QPSK over non offset QPSK?
- **b)** Explain the operation of an integrate and dump receiver.
- c) Write a note on FFT based multicarrier system.
- d) Explain the operation of a carrier recovery system.
- e) Explain the operation of a syndrome decoder for a (n,k) block code.

#### Q.5 Attempt any two questions.

- a) Explain the operation of M-ary PSK transmitter and Receiver. Also draw the phasor diagram and comment on the trade off between value of M and the noise performance.
- **b)** What is matched filter? Derive the expression for impulse response of matched filter and explain with the example.
- c) The error control code has the following Generator matrix.

			•			
[1	0	0	0	1	1	0]
0	1	0	0	0	1	1
0	0	1	0	1	0	1
0	0	0	1	1	1	1
	[1 0 0 0	$\begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \\ 0 & 0 \end{bmatrix}$	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$	$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 \end{bmatrix}$	$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 \end{bmatrix}$

Determine.

- 1) All code words
- 2) Error detection and error correction capabilities.
- 3) Decode the received codeword [1 1 1 1 0 1 0]

16

12

### SLR-FM-238

Set S

No.							5e	נ	Ρ
		T.E.	. (Part - I)	(New) (CB	CS) E>	ami	nation Nov/Dec-2019		
			Electron	ics & Telec	ommu	nica	ation Engineering	_	
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Day & Time:	Date 02:30	e: We 0 PM	dnesday, 1 To 05:30 F	1-12-2019 PM			Max. Mar	ks:	70
Instru	iction	າ <b>ຣ:</b> 1)	Q. No. 1 is book.	s compulsory a	and sho	uld b	e solved in first 30 minutes in ar	SW	er
		2)	Figures to	the right indic	ate full	mark	S.		
Durati		0.14		MCQ/Objec	tive Ty	pe Q	uestions		
Durati	on: 3			altarnativaa fu	rom the	t	Mar	KS:	14
	<b>Cnoo</b> 1)	State	e-Transition	alternatives fi diagram is	rom the	e opt	ions and rewrite the sentence		14
	,	a) c)	Stimulus-r Architectu	esponse mode ral model	el	b) d)	Data-flow model Composition model		
	2)	The	goals of so	ftware testing	leads to	)(	•		
	·	a) c)	Defect tes Both 'a' ar	ting nd 'b'		b) d)	Violation testing None		
3	3)	Rele	ase testing	is also known	as				
		a) c)	Functional Alfa testing	l testing g		b) d)	Regression testing None		
4	4)	Activ	rity planning	g starts from _		L	Only of marinet		
		a) c)	State 0 Stage 1			d)	Both a and b		
Ę	5)	Adva	antages of (	CBSE			<b>—</b> ( ) ()		
		a) c)	Reduced s Reduced r	software cost risk		b) d)	Faster delivery All		
6	6)	Whic	ch of the be	low is risk ider	ntificatio	on ap	proach?		
		a) c)	Network a Checklist	nalysis		b) d)	Forward tracking All		
7	7)	Test	ing helps u	s to of	produc	t by f	inding defects in product.		
		a) c)	Hix defect Measure d	uality		d)	All of the above		
8	8)	Orga	nizing step	is about		,			
	,	a)	Group act	ivities		b)	Distinguishing of activities		
		c)	Identifying	of activities		d)	All		
ę	9)	Fund	tional requ	irement specif	ication	of a s	system should be		
		a) c)	Both a) an	d b)		(a b)	None of these		
	10)	-,	provides	a more strikin	a visual	india	cation of those activities that are		
	,	not p	progressing	to schedule.	5				
		a)	Slip chart			b)	Time line		

a)Slip chartb)I me linec)Gantt chartd)Ball chart

SLR-FM-239 Set P

## Seat

- 11) What are the different types of risk may occur when you develop software?
  - a) Project risks

b) Technical risks

c) Business risks

- d) All of the above
- Risk exposure for each risk can be estimated as Risk Exposure = \_\_\_\_\* probability of occurrence.

\_.

- a) Potential damage
- b) Cost of risk reduction

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Set

- c) Risk reduction leverage
- d) Risk avoidance
- 13) The Gantt chart is used for \_\_\_\_\_
  - a) Tracking project progress
  - b) Knowing the activities
  - c) Knowing starting date of project
  - d) Knowing end date of project
- 14) The base line budget is based on \_\_\_\_\_
  - a) Activity networkc) Proposed plan
- b) Cost monitoringd) None

Seat No.	Set	Ρ
S Day & Time: Instrue	T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM Date: Wednesday, 11-12-2019 Max. Mark 02:30 PM To 05:30 PM ctions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.	s: 56
	Section – I	
Q.2	<ul> <li>Solve any Three.</li> <li>a) Explain test automation with testing workbench.</li> <li>b) Write note on object aggregation.</li> <li>c) Write in briefly the inheritance model.</li> <li>d) List and explain characteristics of software process.</li> </ul>	12
Q.3	<ul> <li>Solve any Two.</li> <li>a) System requirement has IEEE standard. Explain standard suggestions for requirement document.</li> <li>b) List system models and explain any one of them.</li> <li>c) Explain release testing in detail.</li> </ul>	16
	Section – II	
Q.4	<ul> <li>Solve any Three.</li> <li>a) Explain categories of risk.</li> <li>b) Describe forward pass for activity planning.</li> <li>c) What is project? What are different activities of management?</li> <li>d) Explain slip chart as tracking of project progress.</li> </ul>	12
Q.5	<ul> <li>Solve any Two.</li> <li>a) Write step wise project planning activates.</li> <li>b) With suitable example explain Monte Carlo simulation and critical chain concepts.</li> <li>c) What are different methods to visualize the progress of a project?</li> </ul>	16

	SOF	ΓWA	Electronics & Telecommu RE ENGINEERING & PRO	inica JEC	ation Engineering T MANAGEMENT SYSTEM
Day of Time	& Date	e: We 0 PM	dnesday, 11-12-2019 To 05:30 PM		Max. Marks: 70
Instr	uctior	ns: 1) 2)	Q. No. 1 is compulsory and sho book. Figures to the right indicate full	uld b mark	e solved in first 30 minutes in answer s.
_		~ • •	MCQ/Objective Ty	pe Q	uestions
Dura	tion: 3	0 Min		4	Marks: 14
Q.1	1)	Orga a) c)	Inizing step is about Group activities Identifying of activities	b) d)	Distinguishing of activities All
	2)	Func a) c)	ctional requirement specification Complete Both a) and b)	of a s b) d)	system should be Consistent None of these
	3)	not p a) c)	_ provides a more striking visua progressing to schedule. Slip chart Gantt chart	l indic b) d)	cation of those activities that are Time line Ball chart
	4)	Wha a) c)	t are the different types of risk m Project risks Business risks	ay oo b) d)	ccur when you develop software? Technical risks All of the above
	5)	Risk prob a) c)	exposure for each risk can be e ability of occurrence. Potential damage Risk reduction leverage	stima b) d)	ted as Risk Exposure =* Cost of risk reduction Risk avoidance
	6)	The a) b) c) d)	Gantt chart is used for Tracking project progress Knowing the activities Knowing starting date of project Knowing end date of project	t	
	7)	The a) c)	base line budget is based on Activity network Proposed plan	b) d)	Cost monitoring None
	8)	State a) c)	e-Transition diagram is Stimulus-response model Architectural model	b) d)	Data-flow model Composition model
	9)	The a) c)	goals of software testing leads to Defect testing Both 'a' and 'b'	b) d)	 Violation testing None
	10)	Rele a)	ase testing is also known as Functional testing	 b)	Regression testing

# T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019

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Alfa testing d) c) None Set | Q

Seat No.

Activity planning starts from \_\_\_\_\_. 11)

- State 0 a)
- Stage 1 C)

Selection of project b)

Faster delivery

**SLR-FM-239** 

Set Q

- Both a and b d)
- Advantages of CBSE \_\_\_\_\_. 12)
  - Reduced software cost a)
  - C) Reduced risk
- d) All

b)

- Which of the below is risk identification approach? 13) Forward tracking a) b)
  - Network analysis
  - Checklist d) All
- Testing helps us to \_\_\_\_\_ of product by finding defects in product. 14)
  - Fix defect a)

C)

c)

- Improve quality b)
- Measure quality
- All of the above d)

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S	of.	T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2 Electronics & Telecommunication Engineering TWARE ENGINEERING & PROJECT MANAGEMENT	019 SYSTEM	
Day & Time:	Date 02:3	e: Wednesday, 11-12-2019 0 PM To 05:30 PM	Max. Marks	: 56
Instru	ctio	<ul><li>ns: 1) All questions are compulsory.</li><li>2) Figures to the right indicate full marks.</li></ul>		
		Section – I		
Q.2	Solv a) b) c) d)	<b>ve any Three.</b> Explain test automation with testing workbench. Write note on object aggregation. Write in briefly the inheritance model. List and explain characteristics of software process.		12
Q.3	Solv a) b) c)	<b>ve any Two.</b> System requirement has IEEE standard. Explain standard sugge requirement document. List system models and explain any one of them. Explain release testing in detail.	estions for	16
		Section – II		
Q.4	Solv a) b) c) d)	ve any Three. Explain categories of risk. Describe forward pass for activity planning. What is project? What are different activities of management? Explain slip chart as tracking of project progress.		12
Q.5	Solv a) b) c)	ve any Two. Write step wise project planning activates. With suitable example explain Monte Carlo simulation and critica concepts. What are different methods to visualize the progress of a project	al chain ?	16

Seat No.

		1.6	Electronics & Telecommu	am	tion Engineering	
	SOF	Γ₩Δ	RE ENGINEERING & PRO		T MANAGEMENT SYSTEM	
Day Time	& Date	e: We	dnesday, 11-12-2019		Max. Marks: 7	70
Instr	uction	ns: 1)	Q No 1 is compulsory and sho	uld b	e solved in first 30 minutes in answe	٩r
mou	aonoi	10. 1)	book.			
		2)	Figures to the right indicate full	mark	S.	
			MCQ/Objective Ty	pe Q	uestions	
Dura	tion: 3	0 Mir	nutes		Marks: 7	14
Q.1		ose th	ne correct alternatives from the	e opt	ions and rewrite the sentence.	14
	1)	a) c)	Reduced software cost Reduced risk	b) d)	Faster delivery All	
	2)	Whic	ch of the below is risk identification	on ap	proach?	
		a) c)	Network analysis Checklist	b) d)	Forward tracking All	
	3)	Test	ing helps us to of produc	t by	finding defects in product.	
		a) c)	FIX defect Measure quality	d)	Improve quality	
	4)	Oraz	anizing step is about	u)		
	7)	a) c)	Group activities Identifying of activities	b) d)	Distinguishing of activities All	
	5)	Fund	ctional requirement specification	of a s	system should be	
		a) c)	Complete Both a) and b)	b) d)	Consistent None of these	
	6)		_ provides a more striking visua	l indi	cation of those activities that are	
		not p	progressing to schedule.	<b>L</b> )	Time line	
		a) c)	Gantt chart	d)	Ball chart	
	7)	-, Wha	t are the different types of risk m	, av o	cur when you develop software?	
	')	a)	Project risks	b)	Technical risks	
		c)	Business risks	d)	All of the above	
	8)	Risk prob	exposure for each risk can be e ability of occurrence.	stima	ted as Risk Exposure =*	
		a) c)	Potential damage Risk reduction leverage	b) d)	Cost of risk reduction Risk avoidance	
	9)	The a) b) c) d)	Gantt chart is used for Tracking project progress Knowing the activities Knowing starting date of project Knowing end date of project	t		
	10)	The	base line budget is based on			
		a) c)	Activity network Proposed plan	(a d)	None	

### TE (Part I) (New) (CBCS) Examination Nov/Dec-2019

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## SLR-FM-239

Set R

Seat No.

**SLR-FM-239** Set R

- State-Transition diagram is \_\_\_\_\_. 11)
  - Stimulus-response model a)
  - Architectural model c)
- Data-flow model b)
- Composition model d)
- The goals of software testing leads to 12)
  - Violation testing Defect testing b) d) None
  - Both 'a' and 'b' C)
- Release testing is also known as \_\_\_\_ 13) b)
  - Functional testing a)
  - Alfa testing C) d)
- Activity planning starts from \_\_\_\_\_. 14)
  - State 0 a)

a)

- Stage 1 C)
- Selection of project b)

**Regression testing** 

Both a and b d)

None

\_.

	T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2 Electronics & Telecommunication Engineering	019
OF	<b>FWARE ENGINEERING &amp; PROJECT MANAGEMENT</b>	SYSTEM
Date 02:30	e: Wednesday, 11-12-2019 0 PM To 05:30 PM	Max. Marks: 56
ctior	<ul><li>ns: 1) All questions are compulsory.</li><li>2) Figures to the right indicate full marks.</li></ul>	
	Section – I	
Solv a) b) c) d)	<b>ve any Three.</b> Explain test automation with testing workbench. Write note on object aggregation. Write in briefly the inheritance model. List and explain characteristics of software process.	12
Solv a) b) c)	<b>ve any Two.</b> System requirement has IEEE standard. Explain standard sugger requirement document. List system models and explain any one of them. Explain release testing in detail.	16 estions for
	Section – II	
Solv a) b) c) d)	<b>ve any Three.</b> Explain categories of risk. Describe forward pass for activity planning. What is project? What are different activities of management? Explain slip chart as tracking of project progress.	12
Solv a) b) c)	<b>We any Two.</b> Write step wise project planning activates. With suitable example explain Monte Carlo simulation and critical concepts. What are different methods to visualize the progress of a project	16 al chain t?
	OF Date 02:30 ction Solv a) b) c) b) c) Solv a) b) c) b) c) b) c) c) c)	<ul> <li>T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2 Electronics &amp; Telecommunication Engineering OFTWARE ENGINEERING &amp; PROJECT MANAGEMENT</li> <li>Date: Wednesday, 11-12-2019</li> <li>02:30 PM To 05:30 PM</li> <li>ctions: 1) All questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>Section - I</li> </ul> Solve any Three. <ul> <li>a) Explain test automation with testing workbench.</li> <li>b) Write note on object aggregation.</li> <li>c) Write in briefly the inheritance model.</li> <li>d) List and explain characteristics of software process.</li> </ul> Solve any Two. <ul> <li>a) System requirement has IEEE standard. Explain standard suggrequirement document.</li> <li>b) List system models and explain any one of them.</li> <li>c) Explain release testing in detail.</li> </ul> Solve any Three. <ul> <li>a) Explain categories of risk.</li> <li>b) Describe forward pass for activity planning.</li> <li>c) What is project? What are different activities of management?</li> <li>d) Explain slip chart as tracking of project progress.</li> </ul> Solve any Two. <ul> <li>a) Write step wise project planning activates.</li> <li>b) With suitable example explain Monte Carlo simulation and critica concepts.</li> <li>c) What are different methods to visualize the progress of a project</li> </ul>

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Seat No.

# SLR-FM-239 Set R

# T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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.

#### **MCQ/Objective Type Questions**

#### **Duration: 30 Minutes**

C)

c)

Seat

No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. \_ provides a more striking visual indication of those activities that are 1) not progressing to schedule.

Slip chart a)

Gantt chart

- Time line b)
- d) **Ball chart**

#### What are the different types of risk may occur when you develop software? 2) **Technical risks**

- a) **Project risks** b)
  - **Business risks** d) All of the above
- 3) Risk exposure for each risk can be estimated as Risk Exposure = \_\_\_\_\* probability of occurrence.
  - Potential damage a)
  - C) Risk reduction leverage
- The Gantt chart is used for 4)
  - Tracking project progress a)
  - Knowing the activities b)
  - Knowing starting date of project c)
  - Knowing end date of project d)

#### The base line budget is based on \_ 5)

- Activity network b) a) Cost monitoring Proposed plan C) d) None
- 6) State-Transition diagram is \_
  - Stimulus-response model Data-flow model a) b) c)
    - Architectural model Composition model d)
- 7) The goals of software testing leads to Defect testing
  - b) Violation testing a) Both 'a' and 'b' c) None d)
- Release testing is also known as \_\_\_\_ 8) Functional testing Regression testing b) a) Alfa testing d) None c)
- 9) Activity planning starts from \_\_\_\_\_.
  - State 0 b) Selection of project a) C)
    - Stage 1 Both a and b d)
- 10) Advantages of CBSE
  - Reduced software cost a) b) d)
  - C) Reduced risk

S Set

Max. Marks: 70

Marks: 14

14

**SLR-FM-239** 



- Cost of risk reduction b) d) **Risk avoidance**

Faster delivery

All

11) Which of the below is risk identification approach?

- Network analysis a)
- b) Forward tracking
- Checklist d) C) All
- Testing helps us to \_\_\_\_\_ of product by finding defects in product. 12)
  - Fix defect a) C) Measure quality
- Improve quality b) All of the above d)
- Organizing step is about \_\_\_\_\_. 13)
  - Group activities a)

b) Distinguishing of activities

**SLR-FM-239** 

Set S

- Identifying of activities All d)
- Functional requirement specification of a system should be \_\_\_\_\_. 14)
  - Complete a)

c)

- b) Consistent
- Both a) and b) C)
- d) None of these

S	OF	T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-20 Electronics & Telecommunication Engineering FWARE ENGINEERING & PROJECT MANAGEMENT	019 SYSTEM
Day & Time:	Date 02:3	e: Wednesday, 11-12-2019 0 PM To 05:30 PM	Max. Marks: 56
Instru	ctior	<ul><li>1) All questions are compulsory.</li><li>2) Figures to the right indicate full marks.</li></ul>	
		Section – I	
Q.2	Solv a) b) c) d)	<b>ve any Three.</b> Explain test automation with testing workbench. Write note on object aggregation. Write in briefly the inheritance model. List and explain characteristics of software process.	12
Q.3	Solv a) b) c)	<b>ve any Two.</b> System requirement has IEEE standard. Explain standard sugger requirement document. List system models and explain any one of them. Explain release testing in detail.	16 estions for
		Section – II	
Q.4	Solv a) b) c) d)	<b>ve any Three.</b> Explain categories of risk. Describe forward pass for activity planning. What is project? What are different activities of management? Explain slip chart as tracking of project progress.	12
Q.5	Solv a) b) c)	<b>ve any Two.</b> Write step wise project planning activates. With suitable example explain Monte Carlo simulation and critica concepts. What are different methods to visualize the progress of a project	16 al chain ?

Seat

No.

### SLR-FM-239

Set S

# T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

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 the right indicate full marks.
- 3) Assume necessary 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) The 4-point DFT of {1,1,0,0} \_\_\_\_\_
- a) {2,0,2,0} c) {0,4,0,0} 2) FFT algorithm calculates \_\_\_\_\_. a) DTFT \_\_\_\_\_. b) DCT c) DFT \_\_\_\_\_\_. b) DCT d) DST

3) If DFT of a sequence x(n) is X(k) then the DFT of  $x(n)e^{-j2\pi \ln n/2}$  is \_\_\_\_\_. a)  $X((k-l))_N$  b)  $X((k+l))_N$ 

c)  $e^{-j2\pi l}X(k)$  d)  $e^{j2\pi l}X(k)$ 

4) The DFT of the sequence  $x(n) = \delta(n - n_0)$  is \_\_\_\_\_. a) 1 b)  $e^{j2\pi k n_0}$ c)  $e^{-j2\pi k n_0/N}$  d)  $e^{j2\pi k n_0/N}$ 

5) The number of multiplications required for performing the convolution of two sequences with identical length 8 using the indirect method using FFT is \_\_\_\_\_\_.

a)	256	b)	120
c)	192	d)	64

6) Circular time shift of a sequence is equivalent to \_\_\_\_\_.

- a) Multiplication of the sequence x(n) with complex exponential
- b) Multiplication of the sequence X(k) with complex exponential
- c) Multiplication of the sequence x(n) with exponential factor
- d) None
- 7) Unwrapped phase response of FIR filter in pass band is \_\_\_\_\_
  - a) Exponentially increasing b) Exponentially decreasing
  - c) Non-linear d) linear
- 8) When analog butter worth filter is converted to DT filter using Impulse Invariance Method, then \_\_\_\_\_.
  - a) Aliasing can be eliminated
  - b) Aliasing is always present
  - c) Aliasing can be reduced by reducing T
  - d) Aliasing cannot be reduced by reducing T

Max. Marks: 70

Marks: 14

				-		-
					Set	Ρ
9)	The	frequency response of rectangu	ular v	window is		
		$\frac{\sin \omega N}{2}$	<b>ل</b> م)	$\frac{\sin \omega}{2}$		
	a)	$\frac{\sin \omega}{2}$	D)	$\frac{\sin \omega N}{2}$		
	,	$\sin \omega N/2$		$\sin \omega N/2$		
	C)	$\frac{\omega_2}{\omega_2}$	d)	<u>N\u022</u>		
10)	The	relation between Laplace transf	orm	and z-transform is		
	a)	$z = e^{st}$	b)	$z = e^{jst}$		
	c)	$s = e^{zt}$	d)	$z = e^{-st}$		
11)	The char	Impulse response of FIR syster acteristics	n ha	s a linear phase linear		
	a)	$\theta(\omega) = \alpha \omega$	b)	$\theta(\omega) = -\frac{\partial \theta}{\partial \omega}$		
	c)	$\theta(\omega) = -\alpha\omega$	d)	none of above		
12)	The	main lobe width of rectangular	wind	ow is		
	a)	$\frac{\pi}{N}$	b)	$\frac{2\pi}{N}$		
	c)	$\frac{4\pi}{N}$	d)	$\frac{8\pi}{N}$		
40)	The	Number of multiplications in EIF	<b>.</b>			

- The Number of multiplications in FIR system can be reduced using \_\_\_\_\_. 13)
  - a) Finite Impulse Response
  - b) Infinite Impulse Response
  - c) Symmetric nature of Impulse Response
  - d) None of above
- To meet the magnitude response specification for a transition width, one 14) has to .
  - a) Select Proper Window
- b) To Select Kaiser Window

- Select Filter Order c)

- d) Select Rectangular Window

Seat	
No.	

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume necessary data if necessary.

#### Section – I

#### Q.2 Attempt any Four.

- a) Explain the sampling in frequency domain.
- **b)** Compute the Auto correlation of given sequence  $x(n) = \{1,3,3,4,5\}$ .
- c) Derive the relation between DFT and Z transform.
- d) Find IDFT of Sequence using DIF-FFT Algorithm  $X(k) = \{11, -2, -3i, -3, -2 + 3i\}$
- e) Describe briefly the Goertzel algorithm.
- f) Compute Circular convolution.
- $x_1(n) = \{1,3,2,5,4\}$  $x_2(n) = \{4,5,2,3,1\}$

#### Q.3 Attempt any two.

- a) Given  $x(n) = 2^n$  and N=8, Find X(k) using DIF-FFT algorithm.
- b) Perform linear convolution of finite duration sequences  $h(n) = \{1,1,2,1\}$  and  $x(n) = \{1,-1,1,2,1,0,1,-4,3,2,1,0,1,1\}$  using overlap save method?
- c) Compute the circular convolution of the following sequence  $x(n) = \{3,4,5,2\}$ and  $h(n) = \{3,1,4,2\}$  Using DFT and IDFT method.

#### Section – II

#### Q.4 Attempt Any Four.

- a) Explain in detail FIR filter design using frequency sampling technique.
- **b)** Explain the finite word length effect in IIR Filter.
- c) What is warping effect? What is its effect on magnitude and phase response?
- d) Obtain the Direct Form I, II form realization for the system. y(n) = 0.1y(n-1) + 0.2y(n-2) + 2x(n) + 2.6x(n-1) + 0.6x(n-1)
- y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)e) For given specification find the order of analog Butterworth filter.
  - $0.8 \le |H(j\Omega)| \le 1$  for  $0 \le \Omega \le 0.2\pi$  $|H(j\Omega)| \le 0.2$  for  $0.6\pi \le \Omega \le \pi$
- f) Compare Rectangular and Triangular windows.

#### Q.5 Attempt Any Two.

a) Design an FIR Filter approximating the ideal frequency response.

$$Hd(e^{j\omega}) = e^{-j5w}$$
 for  $-\frac{\pi}{2}|\omega| \le \frac{\pi}{2}$ 

= 0 for 
$$\pi/2 \prec |\omega| \leq \pi$$

Using Blackman window with N-11

Max. Marks: 56

Set

16

12

16

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

$$H(s) = \frac{1}{s^2 + \sqrt{2s} + 1}$$

c) Design a digital Butterworth filter satisfying the constraints.  $0.707 \le |H(e^{j\omega})| \le 1$  for  $0 \le \omega \le \pi/2$ 

 $|H(e^{j\omega})| \le 0.2$  for  $3\pi/4 \le \omega \le \pi$ 

with T=1 Sec using Bilinear Transformation

SLR-FM-240

Set P

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No.	

### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

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 the right indicate full marks.
- 3) Assume necessary data if necessary.

#### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

2)

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

- 1) When analog butter worth filter is converted to DT filter using Impulse Invariance Method, then \_\_\_\_\_.
  - a) Aliasing can be eliminated
  - b) Aliasing is always present
  - c) Aliasing can be reduced by reducing T
  - d) Aliasing cannot be reduced by reducing T

The	e frequency response c	of rectangular wind	dow is
a)	$\frac{\sin \omega N/2}{\sin \omega/2}$	b) sin	$\frac{\ln \omega}{2}$ $\frac{\omega N}{2}$
c)	$\frac{\frac{\sin \omega N}{2}}{\frac{\omega}{2}}$	d) -	$\frac{\omega N/2}{N\omega/2}$

- 3) The relation between Laplace transform and z-transform is \_\_\_\_\_.
  - a)  $z = e^{st}$  b)  $z = e^{jst}$
  - c)  $s = e^{zt}$  d)  $z = e^{-st}$
- 4) The Impulse response of FIR system has a linear phase linear characteristics \_\_\_\_\_.
  - a)  $\theta(\omega) = \alpha \omega$  b)  $\theta(\omega) = -\frac{\partial \theta}{\partial \omega}$
  - c)  $\theta(\omega) = -\alpha \omega$  d) none of above
- 5) The main lobe width of rectangular window is \_\_\_\_\_.
  - a)  $\frac{\pi}{N}$  b)  $\frac{2\pi}{N}$ c)  $\frac{4\pi}{N}$  d)  $\frac{8\pi}{N}$
- 6) The Number of multiplications in FIR system can be reduced using \_\_\_\_\_.
  - a) Finite Impulse Response
  - b) Infinite Impulse Response
  - c) Symmetric nature of Impulse Response
  - d) None of above

•

Max. Marks: 70

Marks: 14

				Set
7)	To has a)	meet the magnitude response sp to Select Proper Window	becif	ication for a transition width, one To Select Kaiser Window
	c)	Select Filter Order	d)́	Select Rectangular Window
8)	The a) c)	e 4-point DFT of {1,1,0,0} {2,0,2,0} {0,4,0,0}	b) d)	{2,1+2j, -2, 1-2j} {2,1-j,0,1+j}
9)	FFT a) c)	「algorithm calculates DTFT DFT	b) d)	DCT DST
10)	lf D a) c)	FT of a sequence $x(n)$ is $X(k)$ the $X((k-l))_N e^{-j2\pi l}X(k)$	en th b) d)	the DFT of $x(n)e^{-j2\pi \ln n/2}$ is $X((k+l))_N$ $e^{j2\pi l}X(k)$
11)	The a) c)	e DFT of the sequence $x(n) = \delta(1)$ $e^{-j2\pi k n_0}/N$	n — b) d)	$n_0$ ) is $e^{j2\pi k n_0}$ $e^{j2\pi k n_0}/_N$
12)	The two is _	e number of multiplications requir sequences with identical length	ed f 8 us	or performing the convolution of sing the indirect method using FFT
	a) c)	256 192	d)	120 64
	0)	102	u)	т

- 13) Circular time shift of a sequence is equivalent to \_\_\_\_\_.
  - a) Multiplication of the sequence x(n) with complex exponential
  - b) Multiplication of the sequence X(k) with complex exponential
  - c) Multiplication of the sequence x(n) with exponential factor
  - d) None
- 14) Unwrapped phase response of FIR filter in pass band is \_\_\_\_\_.
  - a) Exponentially increasing b) Exponentially decreasing
  - c) Non-linear

d) linear

**SLR-FM-240** 

Set

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume necessary data if necessary.

#### Section – I

#### Q.2 Attempt any Four.

Seat

No.

- a) Explain the sampling in frequency domain.
- **b)** Compute the Auto correlation of given sequence  $x(n) = \{1,3,3,4,5\}$ .
- c) Derive the relation between DFT and Z transform.
- d) Find IDFT of Sequence using DIF-FFT Algorithm  $X(k) = \{11, -2, -3i, -3, -2 + 3i\}$
- e) Describe briefly the Goertzel algorithm.
- f) Compute Circular convolution.  $x_1(n) = \{1,3,2,5,4\}$  $x_2(n) = \{4,5,2,3,1\}$

#### Q.3 Attempt any two.

- a) Given  $x(n) = 2^n$  and N=8, Find X(k) using DIF-FFT algorithm.
- **b)** Perform linear convolution of finite duration sequences  $h(n) = \{1,1,2,1\}$  and  $x(n) = \{1,-1,1,2,1,0,1,-4,3,2,1,0,1,1\}$  using overlap save method?
- c) Compute the circular convolution of the following sequence  $x(n) = \{3,4,5,2\}$ and  $h(n) = \{3,1,4,2\}$  Using DFT and IDFT method.

#### Section – II

#### Q.4 Attempt Any Four.

- a) Explain in detail FIR filter design using frequency sampling technique.
- **b)** Explain the finite word length effect in IIR Filter.
- c) What is warping effect? What is its effect on magnitude and phase response?
- d) Obtain the Direct Form I, II form realization for the system. y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) For given specification find the order of analog Butterworth filter.  $0.8 \le |H(j\Omega)| \le 1$  for  $0 \le \Omega \le 0.2\pi$  $|H(j\Omega)| \le 0.2$  for  $0.6\pi \le \Omega \le \pi$
- f) Compare Rectangular and Triangular windows.

#### Q.5 Attempt Any Two.

a) Design an FIR Filter approximating the ideal frequency response.

$$Hd(e^{j\omega}) = e^{-j5w}$$
 for  $-\frac{\pi}{2}|\omega| \le \frac{\pi}{2}$ 

= 0 for 
$$\frac{\pi}{2} \prec |\omega| \leq \pi$$

Using Blackman window with N-11



**SLR-FM-240** 

Max. Marks: 56

12

16

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

$$H(s) = \frac{1}{s^2 + \sqrt{2s} + 1}$$

c) Design a digital Butterworth filter satisfying the constraints.  $0.707 \le |H(e^{j\omega})| \le 1$  for  $0 \le \omega \le \pi/2$ 

 $|H(e^{j\omega})| \le 0.2$  for  $3\pi/4 \le \omega \le \pi$ 

with T=1 Sec using Bilinear Transformation

SLR-FM-240

Set Q

Seat No.

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING

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 the right indicate full marks.
- 3) Assume necessary data if necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Marks: 14

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

The number of multiplications required for performing the convolution of 1) two sequences with identical length 8 using the indirect method using FFT is

13 _		•			
a)	256			b)	120
c)	192			d)	64

- 2) Circular time shift of a sequence is equivalent to \_\_\_\_\_
  - Multiplication of the sequence x(n) with complex exponential a)
  - Multiplication of the sequence X(k) with complex exponential b)
  - Multiplication of the sequence x(n) with exponential factor C)
  - d) None
- 3) Unwrapped phase response of FIR filter in pass band is
  - a) Exponentially increasing b) Exponentially decreasing
  - Non-linear d) Linear C)
- When analog butter worth filter is converted to DT filter using Impulse 4) Invariance Method, then \_\_\_\_
  - a) Aliasing can be eliminated
  - Aliasing is always present b)
  - Aliasing can be reduced by reducing T c)
  - d) Aliasing cannot be reduced by reducing T
- The frequency response of rectangular window is \_\_\_\_\_ 5) nin aNI /

a) $\frac{\frac{\sin \omega N}{2}}{\frac{\sin \omega}{2}}$	b)	$\frac{\sin \omega}{2} \frac{\sin \omega N}{\sin \omega N}$
c) $\frac{\frac{\sin \omega N}{2}}{\frac{\omega}{2}}$	d)	$\frac{\sin \omega N}{\frac{N\omega}{2}}$

- The relation between Laplace transform and z-transform is \_\_\_\_\_. 6)
  - a)  $z = e^{st}$ b)  $z = e^{jst}$ c)  $s = e^{zt}$ d)  $z = e^{-st}$

Max. Marks: 70

Set







Set

Seat	
No.	

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume necessary data if necessary.

#### Section – I

#### Q.2 Attempt any Four.

- a) Explain the sampling in frequency domain.
- **b)** Compute the Auto correlation of given sequence  $x(n) = \{1,3,3,4,5\}$ .
- c) Derive the relation between DFT and Z transform.
- **d)** Find IDFT of Sequence using DIF-FFT Algorithm  $X(k) = \{11, -2, -3i, -3, -2 + 3i\}$
- e) Describe briefly the Goertzel algorithm.
- f) Compute Circular convolution.
- $x_1(n) = \{1,3,2,5,4\}$  $x_2(n) = \{4,5,2,3,1\}$

#### Q.3 Attempt any two.

- a) Given  $x(n) = 2^n$  and N=8, Find X(k) using DIF-FFT algorithm.
- **b)** Perform linear convolution of finite duration sequences  $h(n) = \{1,1,2,1\}$  and  $x(n) = \{1,-1,1,2,1,0,1,-4,3,2,1,0,1,1\}$  using overlap save method?
- c) Compute the circular convolution of the following sequence  $x(n) = \{3,4,5,2\}$ and  $h(n) = \{3,1,4,2\}$  Using DFT and IDFT method.

#### Section – II

#### Q.4 Attempt Any Four.

- a) Explain in detail FIR filter design using frequency sampling technique.
- **b)** Explain the finite word length effect in IIR Filter.
- c) What is warping effect? What is its effect on magnitude and phase response?
- d) Obtain the Direct Form I, II form realization for the system. y(n) = 0.1y(n-1) + 0.2y(n-2) + 2x(n) + 2.6x(n-1) + 0.6x(n-1)
  - y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) For given specification find the order of analog Butterworth filter.  $0.8 \le |H(j\Omega)| \le 1$  for  $0 \le \Omega \le 0.2\pi$  $|H(j\Omega)| \le 0.2$  for  $0.6\pi \le \Omega \le \pi$
- f) Compare Rectangular and Triangular windows.

#### Q.5 Attempt Any Two.

a) Design an FIR Filter approximating the ideal frequency response.

$$Hd(e^{j\omega}) = e^{-j5w}$$
 for  $-\frac{\pi}{2}|\omega| \le \frac{\pi}{2}$ 

= 0 for 
$$\pi/2 \prec |\omega| \leq \pi$$

Using Blackman window with N-11

9

Max. Marks: 56

16

12



12

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

$$H(s) = \frac{1}{s^2 + \sqrt{2s} + 1}$$

c) Design a digital Butterworth filter satisfying the constraints.  $0.707 \le |H(e^{j\omega})| \le 1$  for  $0 \le \omega \le \pi/2$ 

 $|H(e^{j\omega})| \le 0.2$  for  $3\pi/4 \le \omega \le \pi$ 

with T=1 Sec using Bilinear Transformation

SLR-FM-240

Set R

# Set

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

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 the right indicate full marks.
- 3) Assume necessary data if necessary.

#### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

6)

Seat

No.

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

- 1) The relation between Laplace transform and z-transform is \_\_\_\_\_.
  - a)  $z = e^{st}$ b)  $z = e^{jst}$ c)  $s = e^{zt}$ d)  $z = e^{-st}$
- 2) The Impulse response of FIR system has a linear phase linear characteristics \_\_\_\_\_.
  - a)  $\theta(\omega) = \alpha \omega$ b)  $\theta(\omega) = -\frac{\partial \theta}{\partial \omega}$

C)	$\theta(\omega) = -\alpha\omega$	d)	none of	fabov
----	----------------------------------	----	---------	-------

#### 3) The main lobe width of rectangular window is \_\_\_\_\_.

. \	π		2π
a)	$\overline{N}$	D)	N
	$4\pi$	d)	$8\pi$
C)	N	u)	N

- 4) The Number of multiplications in FIR system can be reduced using \_\_\_\_\_.
  - a) Finite Impulse Response
  - b) Infinite Impulse Response
  - c) Symmetric nature of Impulse Response
  - d) None of above

# 5) To meet the magnitude response specification for a transition width, one has to \_\_\_\_\_.

- a) Select Proper Window b) To Se
- c) Select Filter Order d) Se
- b) To Select Kaiser Windowd) Select Rectangular Window
- The 4-point DFT of {1,1,0,0} \_\_\_\_\_.
  - a)  $\{2,0,2,0\}$ c)  $\{0,4,0,0\}$ b)  $\{2,1+2j, -2, 1-2j\}$ d)  $\{2,1-j,0,1+j\}$
- 7) FFT algorithm calculates \_\_\_\_\_.
  - a) DTFT b) DCT
    - c) DFT d) DST

8) If DFT of a sequence x(n) is X(k) then the DFT of  $x(n)e^{-j2\pi \ln n/2}$  is \_\_\_\_\_. a)  $X((k-l))_N$  b)  $X((k+l))_N$ 

c)  $e^{-j2\pi l}X(k)$  d)  $e^{j2\pi l}X(k)$ 

Marks: 14

Set

Max. Marks: 70

**SLR-FM-240** 

9) The DFT of the sequence  $x(n) = \delta(n - n_0)$  is \_\_\_\_\_

- a) 1 b)  $e^{j2\pi k n_0}$
- c)  $e^{-j2\pi k n_0}/N$  d)  $e^{j2\pi k n_0}/N$

 The number of multiplications required for performing the convolution of two sequences with identical length 8 using the indirect method using FFT is

- a) 256 b) 120
- c) 192 d) 64

11) Circular time shift of a sequence is equivalent to \_\_\_\_\_

- a) Multiplication of the sequence x(n) with complex exponential
- b) Multiplication of the sequence X(k) with complex exponential
- c) Multiplication of the sequence x(n) with exponential factor
- d) None
- 12) Unwrapped phase response of FIR filter in pass band is \_
  - a) Exponentially increasing b) Exponentially decreasing

**SLR-FM-240** 

Set

- c) Non-linear d) linear
- 13) When analog butter worth filter is converted to DT filter using Impulse Invariance Method, then \_\_\_\_\_.
  - a) Aliasing can be eliminated
  - b) Aliasing is always present
  - c) Aliasing can be reduced by reducing T
  - d) Aliasing cannot be reduced by reducing T

14) The frequency response of rectangular window is \_\_\_\_\_.

<b>c</b> )	$\sin \omega N/2$
a)	$\frac{\sin \omega}{2}$
<b>~</b> )	$\sin \omega N$
C)	01

b)  $\frac{\frac{\sin \omega}{2}}{\frac{\sin \omega N}{2}}$ d)  $\frac{\frac{\sin \omega N}{2}}{N\omega/2}$ 

	T F (Part – I)	(New
No.		
Seat		

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume necessary data if necessary.

#### Section – I

#### Q.2 Attempt any Four.

- a) Explain the sampling in frequency domain.
- **b)** Compute the Auto correlation of given sequence  $x(n) = \{1,3,3,4,5\}$ .
- c) Derive the relation between DFT and Z transform.
- d) Find IDFT of Sequence using DIF-FFT Algorithm  $X(k) = \{11, -2, -3i, -3, -2 + 3i\}$
- e) Describe briefly the Goertzel algorithm.
- f) Compute Circular convolution.
- $x_1(n) = \{1,3,2,5,4\}$  $x_2(n) = \{4,5,2,3,1\}$

#### Q.3 Attempt any two.

- a) Given  $x(n) = 2^n$  and N=8, Find X(k) using DIF-FFT algorithm.
- **b)** Perform linear convolution of finite duration sequences  $h(n) = \{1,1,2,1\}$  and  $x(n) = \{1,-1,1,2,1,0,1,-4,3,2,1,0,1,1\}$  using overlap save method?
- c) Compute the circular convolution of the following sequence  $x(n) = \{3,4,5,2\}$ and  $h(n) = \{3,1,4,2\}$  Using DFT and IDFT method.

#### Section – II

#### Q.4 Attempt Any Four.

- a) Explain in detail FIR filter design using frequency sampling technique.
- **b)** Explain the finite word length effect in IIR Filter.
- c) What is warping effect? What is its effect on magnitude and phase response?
- d) Obtain the Direct Form I, II form realization for the system. y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) For given specification find the order of analog Butterworth filter.  $0.8 \le |H(j\Omega)| \le 1$  for  $0 \le \Omega \le 0.2\pi$ 
  - $|H(j\Omega)| \le 0.2$  for  $0.6\pi \le \Omega \le \pi$
- f) Compare Rectangular and Triangular windows.

#### Q.5 Attempt Any Two.

a) Design an FIR Filter approximating the ideal frequency response.

$$Hd(e^{j\omega}) = e^{-j5w}$$
 for  $-\frac{\pi}{2}|\omega| \le \frac{\pi}{2}$ 

= 0 for 
$$\frac{\pi}{2} \prec |\omega| \leq \pi$$

Using Blackman window with N-11

Set S

Max. Marks: 56

16

12

12

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

$$H(s) = \frac{1}{s^2 + \sqrt{2s} + 1}$$

c) Design a digital Butterworth filter satisfying the constraints.  $0.707 \le |H(e^{j\omega})| \le 1$  for  $0 \le \omega \le \pi/2$ 

 $|H(e^{j\omega})| \le 0.2$  for  $3\pi/4 \le \omega \le \pi$ 

with T=1 Sec using Bilinear Transformation

SLR-FM-240

Set S

, ,	a) c)	IE IP, TI	b) d)	RI, IE RI, TI
)	SP	of 8051 is of wide and it is after reset.	loade	ed with the default value of
	a) c)	2 byte, 08H 1 byte, 09H	b) d)	8 bit, 07H 8 bit, 06H
)	ACA calli a) c)	ALL instruction allows specifying _ ng subroutine within progr 2byte, 3K 9bit, 2K	am m b) d)	_ address in the instruction and nemory block. 11bit, 2K 1byte, 3K
)	Whi exte a) c)	ch of the following instruction per ernal RAM of 16bit address? MOV @ DPTR, A MOV A, @ Ri	form b) d)	the move accumulator to MOVX @ Ri, A MOVX @ DPTR, A
)	In 8 a) c)	051 which interrupt has highest p IE1 IE0	riority b) d)	/? TF0 TF1
)	The a) c)	bit address range for the byte ad 00-07H 20-27H	dress b) d)	s 25H is 28-2Fh 30-37H
)	In 8 a) b) c) d)	bit signed no. operations, OV is s carry is generated from D7 bit carry is generated from D3 bit carry is generated from D7 xor D carry is generated from D7 xor D	set to 3 bit 6 bit	1 if
)	To a add a) c)	address a memory location out of ress lines required is log N (to the base 2) log N (to the base e)	N me b) d)	emory locations, the number of log N (to the base 10) log (2N) (to the base e)

Day & Date: Monday, 16-12-2019

Time: 02:30 PM To 05:30 PM

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### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER – I**

Page **1** of **12** 

Max. Marks: 70

3) Assume suitable data if necessary.

2) Figures to the right indicate full marks.

### **MCQ/Objective Type Questions**

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

**Duration: 30 Minutes** Q.1 Choose the correct alternatives from the options.

Book.

- Serial port interrupt is generated, if bits are set. 1)
- 2
- 3)
- 4
- 5
- 6
- 7

# 8

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Marks: 14

- 9) Which ports assist in addressing lower order and higher address bytes into the data bus simultaneously, while accessing the external data memory?
  - Port 0 & Port 1 respectively a)
  - c) Port 0 & Port 2 respectively
- b) Port 1 & Port 2 respectively d) Port 2 & Port 3 respectively
- How does the microcontroller communicate with the external 10) peripherals/memory?
  - a) via I/O ports

- b) via register arrays
- c) via memory all of the above d)
- How many data lines are essential in addition to RS, EN and RW control 11) lines for interfacing LCD with Atmel 89C51 microcontroller?
  - a) 3 5 b)
  - c) 8 d) 10
- 12) Which control signal/s is/are generated by timing and control unit of 8051 microcontroller in order to access the off-chip devices apart from the internal timings?
  - ALE b) a) c) RD and WR
- Which of the following statements is true? 13)
  - a) In Simplex mode of serial communication, data is transmitted both from the transmitter to the receiver, as well as from the receiver to the transmitter.
  - b) In Half Duplex mode of serial communication, data is transmitted only from the transmitter to the receiver.
  - c) In Full Duplex mode of serial communication, data is exchanged between the transmitter and the receiver using two different channels.
  - d) None of the options mentioned
- 14) How many times the instruction CPL A is executed in the following program of an 8051?

MOV A, #F0H MOV R1, #60 NEXT: MOV R6, #10H AGAIN: CPL A

DJNZ R6, AGAIN DJNZ R1, NEXT a) 600 times c) 690 times

- b) 900 times
- d) 960 times

- **PSEN**
- d) All of the above

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No.	

### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLER – 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

#### Q.2 Attempt any four.

- a) Give comparison CISC and RISC.
- **b)** With one example explain SJMP, AJMP and LJMP instructions. Specify the range for each instruction.
- c) Explain How interrupts are handled by 8051 Microcontroller.
- d) Assuming SMOD=0 and Fc=11.0592MHz, Calculate Value to be loaded in TH1 register for generating the baud rate of 9600, 4800, 2400 and 1200.
- e) Explain the data memory organization of 8051 Microcontroller.

#### Q.3 Attempt any two

- a) Write assembly language program to copy a block of 10 bytes of data from 35H to 60H.
- b) Draw and explain detail architecture of 8051.
- c) Discuss and compare Timer Mode 1 and Mode2 of 8051.

#### Section – II

#### Q.4 Solve any four of the following.

- a) A switch is connected to pin P1.7. Write assembly Language program to check the status of SW and perform the following:
  - 1) If SW=0, send letter 'N' to P2.
  - 2) If SW=1, send letter 'Y' to P2
  - Use the carry flag to check the switch status.
- b) Write a program for blinking LED connected to P2.0
- c) How DAC 0808 can be interfaced to 8051 Microcontroller. Write a Program for generating rising ramp signal.
- d) Write an 8051 program to transfer the message "SUS" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- e) How we can design obstruction detecting circuit using 8051 Microcontroller?
- f) Assume that XTAL = 11.0592 MHz. What value do we need to load the timer's register if we want to have a time delay of 5 ms (milliseconds)? Show the program for timer 0 to create a pulse width of 5 ms on P2.3.

#### Q.5 Solve any two of the following

- a) A door sensor is connected to the P1.1pin, and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. You can sound the buzzer by sending a square wave of a five hundred Hz.
- **b)** Show the design of an 8051-based system with 8K bytes of program ROM and 16K bytes of data RAM.
- c) Draw and Explain interfacing of Matrix keyboard (4X4) to microcontroller.

Max. Marks: 56

Set

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#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER – I**

Day & Date: Monday, 16-12-2019 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 suitable data if necessary.

### MCQ/Objective Type Questions

#### Q.1 Choose the correct alternatives from the options.

- To address a memory location out of N memory locations, the number of 1) address lines required is \_\_\_\_ b)
  - a) log N (to the base 2)
  - c) log N (to the base e) d)
- Which ports assist in addressing lower order and higher address bytes 2) into the data bus simultaneously, while accessing the external data memorv?

b)

- a) Port 0 & Port 1 respectively
- c) Port 0 & Port 2 respectively d)
- How does the microcontroller communicate with the external 3) peripherals/memory?
  - a) via I/O ports

- c) via memory How many data lines are essential in addition to RS, EN and RW control 4)
  - lines for interfacing LCD with Atmel 89C51 microcontroller?
    - a) 3 b) c) 8 d)
- 5) Which control signal/s is/are generated by timing and control unit of 8051 microcontroller in order to access the off-chip devices apart from the internal timinas?
  - a) ALE b) PSEN
  - c) RD and WR All of the above d)
- 6) Which of the following statements is true?
  - a) In Simplex mode of serial communication, data is transmitted both from the transmitter to the receiver, as well as from the receiver to the transmitter.
  - b) In Half Duplex mode of serial communication, data is transmitted only from the transmitter to the receiver.
  - In Full Duplex mode of serial communication, data is exchanged c) between the transmitter and the receiver using two different channels.
  - None of the options mentioned d)

Marks: 14 14

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Max. Marks: 70

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Port 2 & Port 3 respectively

log N (to the base 10)

log (2N) (to the base e)

Port 1 & Port 2 respectively

- b) via register arrays
- all of the above d)
  - 5
  - 10
7) How many times the instruction CPL A is executed in the following program of an 8051?

MOV A, #F0H MOV R1, #60 NEXT: MOV R6, #10H AGAIN: CPL A DJNZ R6, AGAIN DJNZ R1, NEXT a) 600 times b) 900 times c) 690 times d) 960 times Serial port interrupt is generated, if \_\_\_\_ 8) \_\_ bits are set. a) IE b) RI. IE c) IP, TI d) RI, TI SP of 8051 is of \_\_\_\_\_ wide and it is loaded with the default value of 9) after reset. 2 byte, 08H 8 bit, 07H b) a) c) 1 byte, 09H d) 8 bit, 06H 10) ACALL instruction allows specifying \_\_\_\_\_ address in the instruction and calling subroutine within \_\_\_\_\_ program memory block. a) 2byte, 3K 11bit, 2K b) c) 9bit, 2K d) 1byte, 3K Which of the following instruction perform the move accumulator to 11) external RAM of 16bit address? a) MOV @ DPTR, A b) MOVX @ Ri, A MOVX @ DPTR, A c) MOV A, @ Ri d) In 8051 which interrupt has highest priority? 12) a) IE1 TF0 b) c) IE0 d) TF1 13) The bit address range for the byte address 25H is \_\_\_\_\_. 00-07H b) 28-2Fh a) 20-27H d) 30-37H C) 14) In 8 bit signed no. operations, OV is set to 1 if \_\_\_\_\_. a) carry is generated from D7 bit carry is generated from D3 bit b)

c) carry is generated from D7 xor D3 bit

d) carry is generated from D7 xor D6 bit

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Set Q

12

# SLR-FM-241

Seat	
No.	

### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLER – 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

#### Q.2 Attempt any four.

- a) Give comparison CISC and RISC.
- b) With one example explain SJMP, AJMP and LJMP instructions. Specify the range for each instruction.
- c) Explain How interrupts are handled by 8051 Microcontroller.
- **d)** Assuming SMOD=0 and Fc=11.0592MHz, Calculate Value to be loaded in TH1 register for generating the baud rate of 9600, 4800, 2400 and 1200.
- e) Explain the data memory organization of 8051 Microcontroller.

#### Q.3 Attempt any two

- a) Write assembly language program to copy a block of 10 bytes of data from 35H to 60H.
- b) Draw and explain detail architecture of 8051.
- c) Discuss and compare Timer Mode 1 and Mode2 of 8051.

#### Section – II

#### Q.4 Solve any four of the following.

- a) A switch is connected to pin P1.7. Write assembly Language program to check the status of SW and perform the following:
  - 1) If SW=0, send letter 'N' to P2.
  - 2) If SW=1, send letter 'Y' to P2
  - Use the carry flag to check the switch status.
- b) Write a program for blinking LED connected to P2.0
- c) How DAC 0808 can be interfaced to 8051 Microcontroller. Write a Program for generating rising ramp signal.
- d) Write an 8051 program to transfer the message "SUS" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- e) How we can design obstruction detecting circuit using 8051 Microcontroller?
- f) Assume that XTAL = 11.0592 MHz. What value do we need to load the timer's register if we want to have a time delay of 5 ms (milliseconds)? Show the program for timer 0 to create a pulse width of 5 ms on P2.3.

#### Q.5 Solve any two of the following

- a) A door sensor is connected to the P1.1pin, and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. You can sound the buzzer by sending a square wave of a five hundred Hz.
- **b)** Show the design of an 8051-based system with 8K bytes of program ROM and 16K bytes of data RAM.
- c) Draw and Explain interfacing of Matrix keyboard (4X4) to microcontroller.

Max. Marks: 56

Set

12

16

		MICROCONTR	OLL	ER – I
Day & Time	& Date : 02:30	e: Monday,16-12-2019 0 PM To 05:30 PM		Max. Marks: 70
Instr	uction	<b>ns:</b> 1) Q. No. 1 is compulsory and sho Book.	uld b	e solved in first 30 minutes in answer
		<ul><li>2) Figures to the right indicate full</li><li>3) Assume suitable data if necess</li></ul>	mark ary.	S.
		MCQ/Objective Ty	pe C	Questions
Dura	tion: 3	0 Minutes		Marks: 14
Q.1	Choc 1)	Dise the correct alternatives from the In 8051 which interrupt has highest p a) IE1 c) IE0	e opt priorit b) d)	ions. 14 y? TF0 TF1
	2)	The bit address range for the byte ac a) 00-07H c) 20-27H	ddres b) d)	s 25H is 28-2Fh 30-37H
	3)	<ul> <li>In 8 bit signed no. operations, OV is</li> <li>a) carry is generated from D7 bit</li> <li>b) carry is generated from D3 bit</li> <li>c) carry is generated from D7 xor D</li> <li>d) carry is generated from D7 xor D</li> </ul>	set to 03 bit 06 bit	o 1 if
	4)	To address a memory location out of address lines required is a) log N (to the base 2) c) log N (to the base e)	<sup>:</sup> N m b) d)	emory locations, the number of log N (to the base 10) log (2N) (to the base e)
	5)	<ul><li>Which ports assist in addressing low into the data bus simultaneously, wh memory?</li><li>a) Port 0 &amp; Port 1 respectively</li><li>c) Port 0 &amp; Port 2 respectively</li></ul>	er oro ile ac b) d)	der and higher address bytes cessing the external data Port 1 & Port 2 respectively Port 2 & Port 3 respectively
	6)	How does the microcontroller community peripherals/memory? a) via I/O ports c) via memory	unica b) d)	te with the external via register arrays all of the above
	7)	How many data lines are essential in lines for interfacing LCD with Atmel 8 a) 3 c) 8	addi 39C5 b) d)	tion to RS, EN and RW control 1 microcontroller? 5 10
	8)	Which control signal/s is/are generat microcontroller in order to access the internal timings?	ed by e off-o	timing and control unit of 8051 chip devices apart from the PSEN

# Seat

No.

# T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

#### C

- а,
- c) RD and WR

- PSEN
- b) d) All of the above

## 4

4

Set

R

0

SLR-FM-241

#### 9) Which of the following statements is true?

- a) In Simplex mode of serial communication, data is transmitted both from the transmitter to the receiver, as well as from the receiver to the transmitter.
- b) In Half Duplex mode of serial communication, data is transmitted only from the transmitter to the receiver.

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Set

- c) In Full Duplex mode of serial communication, data is exchanged between the transmitter and the receiver using two different channels.
- d) None of the options mentioned
- 10) How many times the instruction CPL A is executed in the following program of an 8051?

MOV A, #F0H MOV R1, #60 NEXT: MOV R6, #10H AGAIN: CPL A

DJNZ R6, AGAIN DJNZ R1, NEXT

- a) 600 times b) 900 times
- c) 690 times d) 960 times

11) Serial port interrupt is generated, if \_\_\_\_\_ bits are set.

- a) IE b) RI, IE c) IP, TI d) RI, TI
- 12) SP of 8051 is of \_\_\_\_\_ wide and it is loaded with the default value of \_\_\_\_\_ after reset.
  - a) 2 byte, 08H b) 8 bit, 07H
  - c) 1 byte, 09H d) 8 bit, 06H
- 13) ACALL instruction allows specifying \_\_\_\_\_ address in the instruction and calling subroutine within \_\_\_\_\_ program memory block.
  - a) 2byte, 3K b) 11bit, 2K
  - c) 9bit, 2K d) 1byte, 3K
- 14) Which of the following instruction perform the move accumulator to external RAM of 16bit address?
  - a) MOV @ DPTR, A
  - c) MOV A, @ Ri
- b) MOVX @ Ri, A
- d) MOVX @ DPTR, A

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No.	

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLER – 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

#### Q.2 Attempt any four.

- a) Give comparison CISC and RISC.
- b) With one example explain SJMP, AJMP and LJMP instructions. Specify the range for each instruction.
- c) Explain How interrupts are handled by 8051 Microcontroller.
- **d)** Assuming SMOD=0 and Fc=11.0592MHz, Calculate Value to be loaded in TH1 register for generating the baud rate of 9600, 4800, 2400 and 1200.
- e) Explain the data memory organization of 8051 Microcontroller.

#### Q.3 Attempt any two

- a) Write assembly language program to copy a block of 10 bytes of data from 35H to 60H.
- b) Draw and explain detail architecture of 8051.
- c) Discuss and compare Timer Mode 1 and Mode2 of 8051.

#### Section – II

#### Q.4 Solve any four of the following.

- a) A switch is connected to pin P1.7. Write assembly Language program to check the status of SW and perform the following:
  - 1) If SW=0, send letter 'N' to P2.
  - 2) If SW=1, send letter 'Y' to P2
  - Use the carry flag to check the switch status.
- b) Write a program for blinking LED connected to P2.0
- c) How DAC 0808 can be interfaced to 8051 Microcontroller. Write a Program for generating rising ramp signal.
- d) Write an 8051 program to transfer the message "SUS" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- e) How we can design obstruction detecting circuit using 8051 Microcontroller?
- f) Assume that XTAL = 11.0592 MHz. What value do we need to load the timer's register if we want to have a time delay of 5 ms (milliseconds)? Show the program for timer 0 to create a pulse width of 5 ms on P2.3.

#### Q.5 Solve any two of the following

- a) A door sensor is connected to the P1.1pin, and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. You can sound the buzzer by sending a square wave of a five hundred Hz.
- **b)** Show the design of an 8051-based system with 8K bytes of program ROM and 16K bytes of data RAM.
- c) Draw and Explain interfacing of Matrix keyboard (4X4) to microcontroller.

Max. Marks: 56

Set

R

12

16

# T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER – 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.

- 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) How does the microcontroller communicate with the external peripherals/memory?
  - a) via I/O ports b) via register arrays
    - all of the above via memory d) c)
- 2) How many data lines are essential in addition to RS, EN and RW control lines for interfacing LCD with Atmel 89C51 microcontroller?
  - a) 3 5 b)
  - 10 c) 8 d)
- 3) Which control signal/s is/are generated by timing and control unit of 8051 microcontroller in order to access the off-chip devices apart from the internal timings?
  - a) ALE
  - c) RD and WR d) All of the above
- 4) Which of the following statements is true?
  - In Simplex mode of serial communication, data is transmitted both a) from the transmitter to the receiver, as well as from the receiver to the transmitter.
  - b) In Half Duplex mode of serial communication, data is transmitted only from the transmitter to the receiver.
  - In Full Duplex mode of serial communication, data is exchanged C) between the transmitter and the receiver using two different channels.
  - d) None of the options mentioned

**SLR-FM-241** 



Max. Marks: 70

Marks: 14

- **PSEN**
- b)

5) How many times the instruction CPL A is executed in the following program of an 8051?

MOV A, #F0H MOV R1, #60 NEXT: MOV R6, #10H AGAIN: CPL A DJNZ R6, AGAIN DJNZ R1, NEXT a) 600 times b) 900 times c) 690 times d) 960 times 6) Serial port interrupt is generated, if \_\_\_\_\_ \_ bits are set. a) IE b) RI. IE c) IP, TI RI, TI d) 7) SP of 8051 is of \_\_\_\_\_ wide and it is loaded with the default value of after reset. 2 byte, 08H 8 bit, 07H b) a) c) 1 byte, 09H d) 8 bit, 06H ACALL instruction allows specifying \_\_\_\_\_ address in the instruction and 8) calling subroutine within \_\_\_\_\_ program memory block. a) 2byte, 3K 11bit, 2K b) c) 9bit, 2K d) 1byte, 3K 9) Which of the following instruction perform the move accumulator to external RAM of 16bit address? a) MOV @ DPTR, A b) MOVX @ Ri, A c) MOV A, @ Ri d) MOVX @ DPTR, A In 8051 which interrupt has highest priority? 10) TF<sub>0</sub> a) IE1 b) c) IE0 TF1 d) 11) The bit address range for the byte address 25H is \_\_\_\_\_ a) 00-07H b) 28-2Fh d) 30-37H c) 20-27H 12) In 8 bit signed no. operations, OV is set to 1 if \_\_\_\_\_. a) carry is generated from D7 bit b) carry is generated from D3 bit c) carry is generated from D7 xor D3 bit d) carry is generated from D7 xor D6 bit To address a memory location out of N memory locations, the number of 13) address lines required is \_\_\_\_ a) log N (to the base 2) b) log N (to the base 10) c) log N (to the base e) log (2N) (to the base e) d) 14) Which ports assist in addressing lower order and higher address bytes into the data bus simultaneously, while accessing the external data memory? a) Port 0 & Port 1 respectively

c) Port 0 & Port 2 respectively

- b) Port 1 & Port 2 respectively
- Port 2 & Port 3 respectively d)

**SLR-FM-241** 

Set S

#### T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLER – 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

#### Q.2 Attempt any four.

- a) Give comparison CISC and RISC.
- **b)** With one example explain SJMP, AJMP and LJMP instructions. Specify the range for each instruction.
- c) Explain How interrupts are handled by 8051 Microcontroller.
- **d)** Assuming SMOD=0 and Fc=11.0592MHz, Calculate Value to be loaded in TH1 register for generating the baud rate of 9600, 4800, 2400 and 1200.
- e) Explain the data memory organization of 8051 Microcontroller.

#### Q.3 Attempt any two

- a) Write assembly language program to copy a block of 10 bytes of data from 35H to 60H.
- b) Draw and explain detail architecture of 8051.
- c) Discuss and compare Timer Mode 1 and Mode2 of 8051.

#### Section – II

#### Q.4 Solve any four of the following.

- a) A switch is connected to pin P1.7. Write assembly Language program to check the status of SW and perform the following:
  - 1) If SW=0, send letter 'N' to P2.
  - 2) If SW=1, send letter 'Y' to P2

Use the carry flag to check the switch status.

- b) Write a program for blinking LED connected to P2.0
- c) How DAC 0808 can be interfaced to 8051 Microcontroller. Write a Program for generating rising ramp signal.
- **d)** Write an 8051 program to transfer the message "SUS" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.
- e) How we can design obstruction detecting circuit using 8051 Microcontroller?
- f) Assume that XTAL = 11.0592 MHz. What value do we need to load the timer's register if we want to have a time delay of 5 ms (milliseconds)? Show the program for timer 0 to create a pulse width of 5 ms on P2.3.

#### Q.5 Solve any two of the following

- a) A door sensor is connected to the P1.1pin, and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. You can sound the buzzer by sending a square wave of a five hundred Hz.
- **b)** Show the design of an 8051-based system with 8K bytes of program ROM and 16K bytes of data RAM.
- c) Draw and Explain interfacing of Matrix keyboard (4X4) to microcontroller.

16

Set S

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16

12

#### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING**

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) Assume suitable data if required.
- 3) Figures to the right indicate full marks.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

5)

Seat

No.

#### Q.1 Attempt all questions.

- H-plane Tee is called \_\_\_\_\_ 1)
  - a) Current divider
  - c) 3 dB splitter
- b) Power device

b) Number of holes

d) None of these

- d) Reciprocal device
- 2) In case of directional coupler amount of coupling is decided by \_\_\_\_\_.
  - a) Hole dimensions
  - c) Both A & B
- In case of Matched load \_\_\_\_\_. 3)
  - a) Transmission is zero
  - b) Reflection is zero
  - c) Reflection is unity
  - d) Transmission is equal to reflection
- PIN diode is \_\_\_\_\_ type solid state device. 4)
  - Controllable impedance b) Negative resistance a) d) Non-linear resistance
  - c) Non-linear reactance
  - The Two -valley model is best suited to explain the working of \_\_\_\_\_.
    - IMPATT diode a)
    - Gunn diode PIN diode C) d)
- The dominant mode in rectangular waveguide is . 6)
  - **TE10** b) TE11 a)
  - **TE01** C)
- 7) A lossless Transmission line operating at 200 M rad/sec has  $L = 0.6 \mu$ H, C = 10 pF/m. Characteristic impedance of this transmission line is \_\_\_\_\_.
  - a) 244.94 Ω b) 376.7 Ω
  - c) 173.20 Ω d) None of these
- 8) An accelerating dc voltage of 10 kV will result in an electron velocity of m/sec.
  - 5.93 X 10<sup>6</sup> b) 59.3 X 10<sup>6</sup> a)
  - c) 0.593 X 10<sup>6</sup> d) 5.93 X 10<sup>8</sup>
- In case of Magnetron frequency pulling takes place due to \_\_\_\_\_ variations. 9) b) Load
  - a) Supply
  - Frequency d) Amplitude c)

Max. Marks: 70

Marks: 14

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**SLR-FM-242** 





b) TRAPATT diode

d) TE12

- 10) In case of Radar, the frequency of echo signal \_\_\_\_\_ if the target is approaching the radar station.
  - a) Remains constant
- b) Increases
- c) Decreases
- d) None of these
- 11) \_\_\_\_\_ type radar cannot determine range of the moving target.
  - a) Pulsed radarc) Unmodulated CW radar
- b) Modulated CW radard) None of these

Set

- 12) The power in the range of kilo Watts can be measured by \_\_\_\_\_ technique.
  - a) Balometer
- b) Thermisterd) Calorimetric wattmeter
- c) Calorimetricd) Calorimetric wattmeter13) The average power depends on the transmitter power Pt and the duty
  - cycle given by \_\_\_\_\_. a) Pavg = Pt\*duty cycle
- b) Pavg = Pt\*pulse width\*prf
- c) both of the above
- d) None of these
- 14) Accurate Measurement of attenuation can be done by \_\_\_\_\_ method.
  - a) Power Ratio

c)

- using magic Tee
- b) RF substitution
- d) Using slotted line

Seat	
No.	

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if required.

#### Section – I

#### Q.2 Attempt any Three

- a) Explain working of two hole Directional Coupler.
- **b)** A lossless 100  $\Omega$  transmission line terminated in 200 + j 200  $\Omega$ . Find:
  - 1) voltage reflection coefficient
  - 2) Transmission coefficient
  - 3) VSWR
- c) What is PIN diode? Explain any two applications of PIN diode.
- d) IMPATT diode has following parameters  $Vd = 2 \times 10^7$  cm/s, L = 6  $\mu$ m, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

#### Q.3 Attempt any Two.

- a) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- **b)** Write & Explain High frequency limitations of conventional tubes.
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 10 cms. For 2.5 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in dominant mode, group and phase velocities.

#### Section – II

#### Q.4 Attempt any Three.

- a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 <sup>3</sup>/<sub>4</sub> mode, VR = -500 V.
- b) Explain any one method for measurement of VSWR.
- c) Explain Gunn Effect using Two Valley Theory.
- d) Explain Radar Displays.

Max. Marks: 56

16

12

12

9

Set

#### Q.5 Attempt any Two.

- a) Derive Radar range equation.
- b) Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1200 V Beam current = 28 mA Frequency = 8 GHz Gap spacing in either cavity = 1 mm Spacing between two cavities = 4 cm Effective shunt impedance = 40 kohm (Excluding beam loading) Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Efficiency of the amplifier neglecting beam loading
  - iv) Voltage Gain in decibels
- c) Explain any two methods for measurement of attenuation.

**SLR-FM-242** 

Set P

#### **Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING** Day & Date: Friday, 22-11-2019 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 if required. 3) Figures to the right indicate full marks. **MCQ/Objective Type Questions** An accelerating dc voltage of 10 kV will result in an electron velocity of m/sec. 5.93 X 10<sup>6</sup> b) 59.3 X 10<sup>6</sup> a) d) 5.93 X 10<sup>8</sup>

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

**Duration: 30 Minutes** 

Seat

No.

#### Q.1 Attempt all questions.

- 1)
  - 0.593 X 10<sup>6</sup> C)
- In case of Magnetron frequency pulling takes place due to \_\_\_\_\_ variations. 2)
  - Supply b) Load a)
  - Frequency d) Amplitude c)
- In case of Radar, the frequency of echo signal if the target is 3) approaching the radar station.
  - a) Remains constant
  - c) Decreases

- b) Increases d) None of these
- \_ type radar cannot determine range of the moving target. 4)
  - a) Pulsed radar Unmodulated CW radar C)
- b) Modulated CW radar d) None of these
- The power in the range of kilo Watts can be measured by \_\_\_\_\_ technique. 5) b) Thermister
  - Balometer a) c)
    - Calorimetric d) Calorimetric wattmeter
- 6) The average power depends on the transmitter power Pt and the duty cycle given by
  - a)  $Pavg = Pt^*duty cycle$ c) both of the above
- b) Pavg = Pt\*pulse width\*prf
- d) None of these
- 7) Accurate Measurement of attenuation can be done by \_\_\_\_\_ method.
  - a) Power Ratio b) RF substitution d) Using slotted line
  - using magic Tee c)
- H-plane Tee is called . 8)
  - Current divider b) Power device a)
  - 3 dB splitter d) Reciprocal device C)
- In case of directional coupler amount of coupling is decided by \_\_\_\_\_. 9)
  - Hole dimensions a) Both A & B c)
- b) Number of holes
- d) None of these

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# Set

Marks: 14

10) In case of Matched load \_\_\_\_\_.

- a) Transmission is zero
- b) Reflection is zero
- c) Reflection is unity
- d) Transmission is equal to reflection
- 11) PIN diode is \_\_\_\_\_ type solid state device.
  - a) Controllable impedance b) Negative resistance
    - Non-linear reactance d) Non-linear resistance
- 12) The Two -valley model is best suited to explain the working of \_\_\_\_\_.
  - a) IMPATT diode b) TRAPATT diode
  - c) Gunn diode d) PIN diode
- 13) The dominant mode in rectangular waveguide is \_\_\_\_\_.
  - a) TE10 b) TE11
    - c) TE01 d) TE12
- 14) A lossless Transmission line operating at 200 M rad/sec has  $L = 0.6 \mu$ H,
  - C = 10 pF/m. Characteristic impedance of this transmission line is \_\_\_\_\_.
  - a) 244.94 Ω
  - c) 173.20 Ω

c)

- b) 376.7 Ω
- d) None of these

**SLR-FM-242** 

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No.	

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if required.

#### Section – I

#### Q.2 Attempt any Three

- a) Explain working of two hole Directional Coupler.
- **b)** A lossless 100  $\Omega$  transmission line terminated in 200 + j 200  $\Omega$ . Find:
  - 1) voltage reflection coefficient
  - 2) Transmission coefficient
  - 3) VSWR
- c) What is PIN diode? Explain any two applications of PIN diode.
- d) IMPATT diode has following parameters  $Vd = 2 \times 10^7$  cm/s, L = 6  $\mu$ m, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

#### Q.3 Attempt any Two.

- a) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- **b)** Write & Explain High frequency limitations of conventional tubes.
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 10 cms. For 2.5 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in dominant mode, group and phase velocities.

#### Section – II

#### Q.4 Attempt any Three.

- a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 <sup>3</sup>/<sub>4</sub> mode, VR = -500 V.
- b) Explain any one method for measurement of VSWR.
- c) Explain Gunn Effect using Two Valley Theory.
- d) Explain Radar Displays.

Max. Marks: 56

16

12

#### Q.5 Attempt any Two.

- a) Derive Radar range equation.
- b) Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1200 V Beam current = 28 mA Frequency = 8 GHz Gap spacing in either cavity = 1 mm Spacing between two cavities = 4 cm Effective shunt impedance = 40 kohm (Excluding beam loading) Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Efficiency of the amplifier neglecting beam loading
  - iv) Voltage Gain in decibels
- c) Explain any two methods for measurement of attenuation.

**SLR-FM-242** 

Set Q

				VE	ENGINEERING
Day & Time:	Date 10:00	e: Fri D AN	day, 22-11-2019 I To 01:00 PM		Max. Marks: 70
Instru	iction	1 <b>s:</b> 1 2)	) Q. No. 1 is compulsory and sh book. Assume suitable data if required Figures to the right indicate full	ould d.	be solved in first 30 minutes in answer
		5)		ma (	Questions
Durati	00.2	0 N/II		he	Auestions
	011. J				Marks. 14
	Atten 1)	The a) c)	Two -valley model is best suited IMPATT diode Gunn diode	l to e b) d)	explain the working of TRAPATT diode PIN diode
:	2)	The a) c)	dominant mode in rectangular w TE10 TE01	/ave b) d)	guide is TE11 TE12
;	3)	A lo C = a) c)	ssless Transmission line operati 10 pF/m. Characteristic impeda 244.94 Ω 173.20 Ω	ng a nce b) d)	t 200 M rad/sec has $L = 0.6 \mu$ H, of this transmission line is 376.7 $\Omega$ None of these
	4)	An a  a) c)	accelerating dc voltage of 10 kV m/sec. 5.93 X 10 <sup>6</sup> 0.593 X 10 <sup>6</sup>	will ı b) d)	result in an electron velocity of 59.3 X 10 <sup>6</sup> 5.93 X 10 <sup>8</sup>
:	5)	In ca a) c)	ase of Magnetron frequency pull Supply Frequency	ing t b) d)	akes place due to variations. Load Amplitude
	6)	In ca app a) c)	ase of Radar, the frequency of e roaching the radar station. Remains constant Decreases	cho b) d)	signal if the target is Increases None of these
	7)	a) c)	type radar cannot determine Pulsed radar Unmodulated CW radar	rang b) d)	e of the moving target. Modulated CW radar None of these
;	8)	The a) c)	power in the range of kilo Watts Balometer Calorimetric	can b) d)	be measured by technique. Thermister Calorimetric wattmeter
9	9)	The cycl a) c)	average power depends on the e given by Pavg = Pt*duty cycle both of the above	tran b) d)	smitter power Pt and the duty Pavg = Pt*pulse width*prf None of these

## Seat No.

**Electronics & Telecommunication Engineering** DADAD & MICDOWAVE ENCINE

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

Page **9** of **16** 

- Set | R

- 10) Accurate Measurement of attenuation can be done by \_\_\_\_\_ method.
  - a) Power Ratio
  - c) using magic Tee
- b) RF substitution

Set R

- Tee d) Using slotted line
- 11) H-plane Tee is called \_\_\_\_\_.
  - a) Current dividerc) 3 dB splitter
- b) Power deviced) Reciprocal device
- 12) In case of directional coupler amount of coupling is decided by \_\_\_\_\_.
  - a) Hole dimensions
- b) Number of holes
- c) Both A & B
- d) None of these
- 13) In case of Matched load \_\_\_\_\_.
  - a) Transmission is zero
  - b) Reflection is zero
  - c) Reflection is unity
  - d) Transmission is equal to reflection
- 14) PIN diode is \_\_\_\_\_ type solid state device.
  - a) Controllable impedance
- b) Negative resistance
- c) Non-linear reactance
- d) Non-linear resistance

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if required.

#### Section – I

#### Q.2 Attempt any Three

- a) Explain working of two hole Directional Coupler.
- **b)** A lossless 100  $\Omega$  transmission line terminated in 200 + j 200  $\Omega$ . Find:
  - 1) voltage reflection coefficient
  - 2) Transmission coefficient
  - 3) VSWR
- c) What is PIN diode? Explain any two applications of PIN diode.
- d) IMPATT diode has following parameters  $Vd = 2 \times 10^7$  cm/s, L = 6  $\mu$ m, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

#### Q.3 Attempt any Two.

- a) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- **b)** Write & Explain High frequency limitations of conventional tubes.
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 10 cms. For 2.5 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in dominant mode, group and phase velocities.

#### Section – II

#### Q.4 Attempt any Three.

- a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 <sup>3</sup>/<sub>4</sub> mode, VR = -500 V.
- b) Explain any one method for measurement of VSWR.
- c) Explain Gunn Effect using Two Valley Theory.
- d) Explain Radar Displays.

Max. Marks: 56

16

12

12

Set R

#### Q.5 Attempt any Two.

- a) Derive Radar range equation.
- b) Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1200 V Beam current = 28 mA Frequency = 8 GHz Gap spacing in either cavity = 1 mm Spacing between two cavities = 4 cm Effective shunt impedance = 40 kohm (Excluding beam loading) Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Efficiency of the amplifier neglecting beam loading
  - iv) Voltage Gain in decibels
- c) Explain any two methods for measurement of attenuation.

**SLR-FM-242** 

Set R

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

# **Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING**

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) Assume suitable data if required.
- 3) Figures to the right indicate full marks.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Seat

No.

#### Q.1 Attempt all questions.

a)

5)

- In case of Radar, the frequency of echo signal \_\_\_\_\_ if the target is 1) approaching the radar station. b) Increases
  - a) Remains constant
  - C) Decreases
- type radar cannot determine range of the moving target. 2)
  - Pulsed radar b) Modulated CW radar d) None of these
  - Unmodulated CW radar c)
- The power in the range of kilo Watts can be measured by \_\_\_\_\_ technique. 3)
  - Balometer b) Thermister a)
  - Calorimetric d) Calorimetric wattmeter C)
- 4) The average power depends on the transmitter power Pt and the duty cycle given by \_
  - $Pavg = Pt^*duty cycle$ a)
  - both of the above c)
  - Accurate Measurement of attenuation can be done by \_\_\_\_\_ method.
    - Power Ratio a)
    - using magic Tee c)
- H-plane Tee is called . 6)
  - Current divider a)
  - 3 dB splitter C)
- b) Power device
- d) Reciprocal device

b) Number of holes

d) None of these

- In case of directional coupler amount of coupling is decided by \_\_\_\_\_. 7)
  - Hole dimensions a)
  - c) Both A & B
- 8) In case of Matched load
  - Transmission is zero a)
  - b) Reflection is zero
  - Reflection is unity C)
  - d) Transmission is equal to reflection

# **SLR-FM-242**



Max. Marks: 70

Marks: 14

14

- b) Pavg = Pt\*pulse width\*prf

d) None of these

- d) None of these
- b) RF substitution d) Using slotted line

- Set S PIN diode is \_\_\_\_\_ type solid state device. 9) Controllable impedance a) b) Negative resistance d) Non-linear resistance Non-linear reactance c) 10) The Two -valley model is best suited to explain the working of \_\_\_\_\_. IMPATT diode b) TRAPATT diode a) Gunn diode d) PIN diode C) 11) The dominant mode in rectangular waveguide is \_\_\_\_\_. **TE10** b) TE11 a) d) TE12 **TE01** C) 12) A lossless Transmission line operating at 200 M rad/sec has  $L = 0.6 \mu$ H, C = 10 pF/m. Characteristic impedance of this transmission line is 244.94 Ω b) 376.7 Ω a) d) None of these 173.20 Ω c) 13) An accelerating dc voltage of 10 kV will result in an electron velocity of m/sec.
  - 5.93 X 10<sup>6</sup> b) 59.3 X 10<sup>6</sup> a)
    - c) 0.593 X 10<sup>6</sup>
- d) 5.93 X 10<sup>8</sup>

- In case of Magnetron frequency pulling takes place due to \_\_\_\_\_ variations. 14)
  - a) Supply
  - c) Frequency
- b) Load d) Amplitude

Seat	
No.	

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Assume suitable data if required.

#### Section – I

#### Q.2 Attempt any Three

- a) Explain working of two hole Directional Coupler.
- **b)** A lossless 100  $\Omega$  transmission line terminated in 200 + j 200  $\Omega$ . Find:
  - 1) voltage reflection coefficient
  - 2) Transmission coefficient
  - 3) VSWR
- c) What is PIN diode? Explain any two applications of PIN diode.
- d) IMPATT diode has following parameters  $Vd = 2 \times 10^7$  cm/s, L = 6  $\mu$ m, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

#### Q.3 Attempt any Two.

- a) Derive S matrix for E plane tee. Justify the statement "E plane tee acts as a 3 dB splitter".
- **b)** Write & Explain High frequency limitations of conventional tubes.
- c) Determine the cut-off wavelength for the dominant mode in a rectangular waveguide of breadth 10 cms. For 2.5 GHz signal propagated in this waveguide in the dominant mode calculate the guide wavelength in dominant mode, group and phase velocities.

#### Section – II

#### Q.4 Attempt any Three.

- a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 <sup>3</sup>/<sub>4</sub> mode, VR = -500 V.
- b) Explain any one method for measurement of VSWR.
- c) Explain Gunn Effect using Two Valley Theory.
- d) Explain Radar Displays.

Max. Marks: 56

16

12

#### Q.5 Attempt any Two.

- a) Derive Radar range equation.
- b) Two cavity klystron amplifier has following parameters Anode to cathode voltage = 1200 V Beam current = 28 mA Frequency = 8 GHz Gap spacing in either cavity = 1 mm Spacing between two cavities = 4 cm Effective shunt impedance = 40 kohm (Excluding beam loading) Calculate:
  - i) Electron velocity
  - ii) Input gap voltage to give maximum voltage across input cavity
  - iii) Efficiency of the amplifier neglecting beam loading
  - iv) Voltage Gain in decibels
- c) Explain any two methods for measurement of attenuation.

**SLR-FM-242** 

Set S

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

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

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

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### MCQ/Objective Type Questions

**Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)** 

**Duration: 30 Minutes** 

Seat

No.

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

- Which of the following FSR is used for indirect addressing mode of PIC? 1)
  - a) INTCON b) INDF
  - PCL STATUS d) c)

#### Special Purpose Registers of PIC 16F877 are mapped into data space 2) at

- 00H 1FH a) b) 80H - 9FH
- c) both a & b d)
- 3) The SLEEP instructions makes the PIC 16F877
  - Standby mode a) Reset b)
  - c) Power down mode d) none of these
- 4) The Vref for ADC in PIC 16F877 is selected by \_\_\_\_\_ register.
  - ADCON1 a) ADCON0 b)
  - c) ADRES d) PIR1
- The CALL and GOTO instructions provides bit address to allow 5) branching within any \_\_\_\_\_ program memory space
  - 11. 2K a) b) 13.8K
  - d) None of these 16, 64K c)
- 6) The stack memory for PIC16F877 is the part of \_\_\_\_\_.
  - a) Program Memory
    - b) Data Memory
  - c) Either program or data memory
  - d) Neither program nor data memory
- 7) PSA (Prescaler assignment) bit in the option register equals to 1 then
  - a) Prescaler enabled
  - b) Prescaler disabled
  - c) Prescaler assigned to WDT
  - d) Prescaler assigned to TIMER0

**SLR-FM-243** 



Max. Marks: 70

Marks: 14

None of these

- Set P
- 8) PIR1 register contains and PIE1 contains bits.
  - Interrupt Priority, Interrupt Enable a)
  - Interrupt Flag, Interrupt Prioritv b)
  - Interrupt Priority, Interrupt Flag c)
  - d) Interrupt Flag, Interrupt Enable
- 9) The timer used for capture, compare and PWM mode respectively are \_
  - Timer 0, Timer 1, Timer 2 a)
  - b) Timer 2, Timer 1, Timer 0
  - c) Timer 1, Timer 1, Timer 2
  - d) Timer 2, Timer 1, Timer 1
- What is the execution speed of instruction in PIC while operating at the 10) maximum value of clock rate?
  - a) 0.1 μs b) 0.2 µs
  - 0.8 µs c) 0.4 µs d)
- 11) What is the status of shift clock supply in an USART synchronous mode?
  - a) Master internally, Slave externally
  - b) Master externally, Slave internally
  - c) Master & Slave (both) internally
  - d) Master & Slave (both) externally
- Which bit of the SSPCON must be necessarily set so as to enable the 12) synchronization of serial port?
  - a) WCOL **SSPOV** b)
  - c) CKP d) **SSPEN**
- What is the fundamental role exhibited by the CCP module in compare 13) mode in addition to timer 1?
  - To vary the status of synchronization levels a)
  - To vary the duty cycle of the rectified output b)
  - c) To vary the oscillator frequencies in order to receive larger periods
  - d) To vary the pin status in accordance to the precisely controlled time
- Which among the below mentioned aspect issues are supported by 14) capture / compare / PWM modules corresponding to time in PIC 16F877? **Compare Mode** 
  - Capture Mode a)

b) d) All of these

c) PWM mode

#### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Seat

A)

No.

#### **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any two of the following questions. Explain the memory organization of PIC16F877. 1) 2) Explain and give necessity of Brown out reset and Watch Dog Timer. 3) Give the steps to be followed for doing A / D conversion in PIC16F877. Explain the following instructions B) 04 1) clrwdt 2) incfsz Attempt any two of the following questions. Q.3 14 With neat block diagram explain PWM mode. How to vary PWM period and a) duty cycle? Explain CCP1 module, how it is used for compare function along with b) Timer1? Write assembly language program to complement the data on PORTD at c) regular interval of time. Use timer 0 to generate a delay. Section – II Q.4 A) Attempt any two of the following questions. 10 Explain how SPI bus can be used for I/O expansion. a) Draw interfacing of a switch and LED to PIC, when switch is closed the b) LED should turn ON. Write assembly language program for this. c) Explain I<sup>2</sup>C Bus and how to use it? Explain the features of PIC18. B) 04 Q.5 Attempt any two of the following questions. 14 Interface 16x2 LCD to PIC 16F877 and write assembly language program to a) display INDIA on second line of LCD. How to initialize USART for transmission of data in Asynchronous mode. b) Explain the registers associated with it. c) Explain any one automation and control application based on PIC.

Max. Marks: 56

Set

10

## **SLR-FM-243**

Max. Marks: 70

Marks: 14

#### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.1 is compulsory. It should be solved in the first 30 minutes in the 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 and rewrite the sentence. 14

- PIR1 register contains and PIE1 contains bits. 1)
  - Interrupt Priority, Interrupt Enable a)
  - Interrupt Flag, Interrupt Priority b)
  - Interrupt Priority, Interrupt Flag c)
  - d) Interrupt Flag, Interrupt Enable
- 2) The timer used for capture, compare and PWM mode respectively are
  - a) Timer 0, Timer 1, Timer 2
  - b) Timer 2, Timer 1, Timer 0
  - c) Timer 1, Timer 1, Timer 2
  - d) Timer 2, Timer 1, Timer 1
- 3) What is the execution speed of instruction in PIC while operating at the maximum value of clock rate?
  - a) 0.1 µs b) 0.2 µs c) 0.4 μs d) 0.8 µs
- 4) What is the status of shift clock supply in an USART synchronous mode?
  - a) Master internally, Slave externally
  - b) Master externally, Slave internally
  - c) Master & Slave (both) internally
  - d) Master & Slave (both) externally
- Which bit of the SSPCON must be necessarily set so as to enable the 5) synchronization of serial port?
  - a) WCOL b) SSPOV
  - c) CKP d) SSPEN
- 6) What is the fundamental role exhibited by the CCP module in compare mode in addition to timer 1?
  - a) To vary the status of synchronization levels
  - b) To vary the duty cycle of the rectified output
  - c) To vary the oscillator frequencies in order to receive larger periods
  - d) To vary the pin status in accordance to the precisely controlled time



				Set
7)	Wh	ich among the below mentioned	aspe	ct issues are supported by
	cap	oture / compare / PWM modules	corre	sponding to time in PIC 16F877?
	a)	Capture Mode	b)	Compare Mode
	c)	PWM mode	d)	All of these
8)	Wh	ich of the following FSR is used	for in	direct addressing mode of PIC?
	a)	INTCON	b)	INDF
	c)	PCL	d)	STATUS
9)	Spe at _	ecial Purpose Registers of PIC 1	6F87	7 are mapped into data space
	a)	00H - 1FH	b)	80H - 9FH
	c)	both a & b	d)	None of these
10)	The	e SLEEP instructions makes the	PIC 1	6F877
	a)	Reset	b)	Standby mode
	c)	Power down mode	d)	none of these
11)	Th∉	Vref for ADC in PIC 16F877 is	selec	ted by register.
	a)	ADCON0	b)	ADCON1
	c)	ADRES	d)	PIR1
12)	The	e CALL and GOTO instructions p	orovid	es bit address to allow
	bra	nching within any progra	im me	emory space
	a)	11, 2K	b)	13, 8K
	c)	16, 64K	d)	None of these
13)	The a) b) c) d)	e stack memory for PIC16F877 is Program Memory Data Memory Either program or data memory Neither program nor data memory	s the	part of

- PSA (Prescaler assignment) bit in the option register equals to 1 14) then \_\_\_\_\_. a) Prescaler enabled

  - b) Prescaler disabledc) Prescaler assigned to WDTd) Prescaler assigned to TIMER0

Q

#### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Seat No.

A)

#### **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any two of the following questions. Explain the memory organization of PIC16F877. 1) 2) Explain and give necessity of Brown out reset and Watch Dog Timer. 3) Give the steps to be followed for doing A / D conversion in PIC16F877. Explain the following instructions B) 04 1) clrwdt 2) incfsz Attempt any two of the following questions. Q.3 14 With neat block diagram explain PWM mode. How to vary PWM period and a) duty cycle? Explain CCP1 module, how it is used for compare function along with b) Timer1? Write assembly language program to complement the data on PORTD at c) regular interval of time. Use timer 0 to generate a delay. Section – II Q.4 A) Attempt any two of the following questions. 10 Explain how SPI bus can be used for I/O expansion. a) Draw interfacing of a switch and LED to PIC, when switch is closed the b) LED should turn ON. Write assembly language program for this. c) Explain I<sup>2</sup>C Bus and how to use it? Explain the features of PIC18. B) 04 Q.5 Attempt any two of the following questions. 14 Interface 16x2 LCD to PIC 16F877 and write assembly language program to a) display INDIA on second line of LCD. How to initialize USART for transmission of data in Asynchronous mode. b) Explain the registers associated with it. c) Explain any one automation and control application based on PIC.

## **SLR-FM-243**

Max. Marks: 56

Set

#### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.1 is compulsory. It should be solved in the first 30 minutes in the 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 and rewrite the sentence. 14

- The CALL and GOTO instructions provides bit address to allow 1) branching within any \_\_\_\_\_ program memory space
  - 11, 2K b) 13.8K a) C)
    - 16, 64K d) None of these
- 2) The stack memory for PIC16F877 is the part of \_\_\_\_\_.
  - a) Program Memory
  - b) Data Memory
  - c) Either program or data memory
  - d) Neither program nor data memory
- 3) PSA (Prescaler assignment) bit in the option register equals to 1 then
  - a) Prescaler enabled
  - b) Prescaler disabled
  - c) Prescaler assigned to WDT
  - d) Prescaler assigned to TIMER0
- PIR1 register contains \_\_\_\_\_ and PIE1 contains \_\_\_\_\_ bits. 4)
  - a) Interrupt Priority, Interrupt Enable
  - Interrupt Flag, Interrupt Priority b)
  - Interrupt Priority, Interrupt Flag c)
  - d) Interrupt Flag, Interrupt Enable
- 5) The timer used for capture, compare and PWM mode respectively are
  - Timer 0, Timer 1, Timer 2 a)
  - b) Timer 2, Timer 1, Timer 0
  - Timer 1, Timer 1, Timer 2 c)
  - d) Timer 2, Timer 1, Timer 1
- 6) What is the execution speed of instruction in PIC while operating at the maximum value of clock rate?
  - a) 0.1 µs b) 0.2 µs d) 0.8 µs
  - c) 0.4 μs

Max. Marks: 70

Marks: 14

R

Set R

- 7) What is the status of shift clock supply in an USART synchronous mode?
  - a) Master internally, Slave externally
  - b) Master externally, Slave internally
  - c) Master & Slave (both) internally
  - d) Master & Slave (both) externally
- 8) Which bit of the SSPCON must be necessarily set so as to enable the synchronization of serial port?
  - a) WCOL b) SSPOV
  - c) CKP d) SSPEN
- 9) What is the fundamental role exhibited by the CCP module in compare mode in addition to timer 1?
  - a) To vary the status of synchronization levels
  - b) To vary the duty cycle of the rectified output
  - c) To vary the oscillator frequencies in order to receive larger periods
  - d) To vary the pin status in accordance to the precisely controlled time
- 10) Which among the below mentioned aspect issues are supported by capture / compare / PWM modules corresponding to time in PIC 16F877?
  - a) Capture Mode b) Compare Mode
  - c) PWM mode d) All of these
- 11) Which of the following FSR is used for indirect addressing mode of PIC?
  - a) INTCON b) INDF
  - c) PCL d) STATUS
- 12) Special Purpose Registers of PIC 16F877 are mapped into data space at .
  - a) 00H 1FH
  - c) both a & b d)
- b) 80H 9FHd) None of these
- 13) The SLEEP instructions makes the PIC 16F877 \_\_\_\_\_
  - a) Reset b) Standby mode
  - c) Power down mode d) none of these
- 14) The Vref for ADC in PIC 16F877 is selected by \_\_\_\_\_ register.
  - a) ADCON0 c) ADRES

b) ADCON1 d) PIR1

Max. Marks: 56

Seat	
No.	

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 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 if necessary.

#### Section – I

Q.2	A)	<ul> <li>Attempt any two of the following questions.</li> <li>1) Explain the memory organization of PIC16F877.</li> <li>2) Explain and give necessity of Brown out reset and Watch Dog Timer.</li> <li>3) Give the steps to be followed for doing A / D conversion in PIC16F877.</li> </ul>	10
	B)	<ul><li>Explain the following instructions</li><li>1) Clrwdt</li><li>2) Incfsz</li></ul>	04
Q.3	Atte a)	mpt any two of the following questions. With neat block diagram explain PWM mode. How to vary PWM period and duty cycle?	14
	b)	Explain CCP1 module, how it is used for compare function along with Timer1?	
	c)	Write assembly language program to complement the data on PORTD at regular interval of time. Use timer 0 to generate a delay.	
		Section – II	
Q.4	A)	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain how SPI bus can be used for I/O expansion.</li> <li>b) Draw interfacing of a switch and LED to PIC, when switch is closed the LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> </ul>	10
Q.4	A) B)	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain how SPI bus can be used for I/O expansion.</li> <li>b) Draw interfacing of a switch and LED to PIC, when switch is closed the LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> <li>Explain the features of PIC18.</li> </ul>	10
Q.4 Q.5	A) B) Atte a)	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain how SPI bus can be used for I/O expansion.</li> <li>b) Draw interfacing of a switch and LED to PIC, when switch is closed the LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> <li>Explain the features of PIC18.</li> <li>mpt any two of the following questions.</li> <li>Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.</li> </ul>	10 04 14
Q.4 Q.5	A) B) Atte a) b)	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain how SPI bus can be used for I/O expansion.</li> <li>b) Draw interfacing of a switch and LED to PIC, when switch is closed the LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> <li>Explain the features of PIC18.</li> <li>mpt any two of the following questions.</li> <li>Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.</li> <li>How to initialize USART for transmission of data in Asynchronous mode.</li> <li>Explain the registers associated with it.</li> </ul>	10 04 14

# Set R

Seat	
No.	

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)**

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

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

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Marks: 14

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

- What is the execution speed of instruction in PIC while operating at the 1) maximum value of clock rate?
  - a) 0.1 µs b) 0.2 µs
  - c) 0.4 μs d) 0.8 µs
- What is the status of shift clock supply in an USART synchronous mode? 2)
  - a) Master internally, Slave externally
  - b) Master externally, Slave internally
  - c) Master & Slave (both) internally
  - d) Master & Slave (both) externally
- Which bit of the SSPCON must be necessarily set so as to enable the 3) synchronization of serial port?
  - a) WCOL
  - CKP SSPEN c)
- 4) What is the fundamental role exhibited by the CCP module in compare mode in addition to timer 1?
  - a) To vary the status of synchronization levels
  - b) To vary the duty cycle of the rectified output
  - To vary the oscillator frequencies in order to receive larger periods C)
  - d) To vary the pin status in accordance to the precisely controlled time
- Which among the below mentioned aspect issues are supported by 5) capture / compare / PWM modules corresponding to time in PIC 16F877?
  - a) Capture Mode **Compare Mode** b)
  - c) PWM mode All of these d)
- Which of the following FSR is used for indirect addressing mode of PIC? 6)
  - a) INTCON INDF b)
  - c) PCL d) STATUS
- Special Purpose Registers of PIC 16F877 are mapped into data space 7) at
  - 00H 1FH 80H - 9FH b) a)
  - None of these c) both a & b d)



Max. Marks: 70

- b) **SSPOV**
- d)

				SLR-FM-24
				Set
The a) c)	SLEEP instructions makes the Reset Power down mode	PIC 1 b) d)	6F877 Standby mode none of these	
The a) c)	Vref for ADC in PIC 16F877 is s ADCON0 ADRES	select b) d)	ed by ADCON1 PIR1	register.
The brai a) c)	CALL and GOTO instructions p nching within any progra 11, 2K 16, 64K	ldress to allow		
The a) b) c) d)	stack memory for PIC16F877 is Program Memory Data Memory Either program or data memory Neither program nor data memory	s the p ory	part of	

- 12) PSA (Prescaler assignment) bit in the option register equals to 1 then \_\_\_\_\_.
  - a) Prescaler enabled

8)

9)

10)

11)

- b) Prescaler disabled
- c) Prescaler assigned to WDT
- d) Prescaler assigned to TIMER0
- 13) PIR1 register contains \_\_\_\_\_ and PIE1 contains \_\_\_\_\_ bits.
  - a) Interrupt Priority, Interrupt Enable
  - b) Interrupt Flag, Interrupt Priority
  - c) Interrupt Priority, Interrupt Flag
  - d) Interrupt Flag, Interrupt Enable
- 14) The timer used for capture, compare and PWM mode respectively are \_
  - a) Timer 0, Timer 1, Timer 2
  - b) Timer 2, Timer 1, Timer 0
  - c) Timer 1, Timer 1, Timer 2
  - d) Timer 2, Timer 1, Timer 1

Seat	
No.	

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 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 if necessary.

#### Section – I

Q.2	A)	<ul> <li>Attempt any two of the following questions.</li> <li>1) Explain the memory organization of PIC16F877.</li> <li>2) Explain and give necessity of Brown out reset and Watch Dog Timer.</li> <li>3) Give the steps to be followed for doing A / D conversion in PIC16F877.</li> </ul>	10
	B)	<ul><li>Explain the following instructions</li><li>1) clrwdt</li><li>2) incfsz</li></ul>	04
Q.3	Atte a)	mpt any two of the following questions. With neat block diagram explain PWM mode. How to vary PWM period and	14
	b)	Explain CCP1 module, how it is used for compare function along with Timer1?	
	c)	Write assembly language program to complement the data on PORTD at regular interval of time. Use timer 0 to generate a delay.	
		Section – II	
Q.4	A)	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain how SPI bus can be used for I/O expansion.</li> <li>b) Draw interfacing of a switch and LED to PIC, when switch is closed the</li> </ul>	10
		<ul> <li>LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> </ul>	
	B)	<ul> <li>LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> <li>Explain the features of PIC18.</li> </ul>	04
Q.5	B) Atte a)	<ul> <li>LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> <li>Explain the features of PIC18.</li> <li>mpt any two of the following questions.</li> <li>Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.</li> </ul>	04 14
Q.5	B) Atte a) b) c)	<ul> <li>LED should turn ON. Write assembly language program for this.</li> <li>c) Explain I<sup>2</sup>C Bus and how to use it?</li> <li>Explain the features of PIC18.</li> <li>mpt any two of the following questions.</li> <li>Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.</li> <li>How to initialize USART for transmission of data in Asynchronous mode.</li> <li>Explain the registers associated with it.</li> <li>Explain any one automation and control application based on PIC.</li> </ul>	04 14



Max. Marks: 56
Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

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.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

### Marks: 14

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

- For AC power control using DIAC and TRIAC using 230 V AC input, power 1) loss across. TRIAC is approximately % of load power.
  - b) 10 a) 5 C) 0.5 d) 1
- For SCR, holding current is \_\_\_\_\_ than latching current. 2)
  - a) Greater b) Less C)
    - equal d) both (a) and (c)
- In reverse blocking mode of a SCR, junction 3)
  - a) J2 reverse & J1, J3 forward bias
  - b) J3 forward bias & J1, J2 reverse bias
  - c) J1, J3 reverse & J2 forward bias
  - J1, J2 forward & J3 reverse bias d)
- A single phase fully controlled converter with highly inductive load & 4) freewheeling diode provides \_\_\_\_\_direction of voltage & \_\_\_\_\_direction of current.
  - a) Positive, Negative b) Positive, Positive
  - d) Negative, Positive Negative. Negative c)
- 5) Single phase fully controlled rectifier with inductive load is operated from 230 V, 50 Hz AC input & firing angle is 30°. Frequency of ripple in the output is \_\_\_\_\_ Hz. 100
  - 50 a)
  - b) 150 d) 200 C)
- For Class A commutation series R-L-C circuit in series with SCR is 6) b)

b)

d)

- a) Under damped
- c) Critically damped
- IC 1596 is 7)

a)

c)

8)

- a) 3<sub>1/2</sub> digit DVM
  - PLL C)

T = RC

T = 0.7 RC

- Timer The time period of IC 2240 is given as \_
  - T = 0.67 RCb)
  - None of the above d)

Balanced modulator



Set

Max. Marks: 70

Ρ

- Over damped
- d) none

- The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz 9) resolution is \_\_\_\_\_.
  - 4 b) 2 a)
  - c) 7 d) 8
- 10) When trigger and reset both are applied simultaneously to IC 2240 then? Trigger gets activated a)
  - b) Reset gets activated None d)
  - Both a and b
- The IC XR 2240 consist of \_\_\_\_\_. 11)
  - 8 bit Counter a)
- b) 4 bit Counter
- 8 digit Counter d) 4 digit Counter
- 12) Which of the following temperature sensor has sensitivity 10 mv/° c LM 35
  - J-type thermocouple b)
  - PT 100 None d)
- Which of following is self powered temperature sensor? 13)
  - Thermocouple b) RTD
  - C) Thermistor d) None of these
- For input voltage range 0 2V, t2= 2000, required DVM display is. 14)
  - 2 digit a) 3 ½ digit

c)

C)

a)

C)

a)

c)

- b) 3 digit
  - d) 3 ¾ digit

## **SLR-FM-244**

Set P

Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

Day & Date: Monday, 25-11-2019

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 if necessary.

### Section – I

#### Q.2 Answer any three of the following question. 12 a) Draw and explain two transistor analogy of an SCR. b) Explain Class - B type commutation of SCR. Draw and explain AC power control using DIAC and TRIAC for lamp c) dimmer. Explain the basic principle of working of balanced modulator with d) waveform. Q.3 Answer any one of the following question. **08** Draw construction and VI characteristics of SCR and explain its working. a) Draw and explain single phase controlled rectifier with center tapped b) transformer and resistive load. Derive expression for average output voltage & rms load voltage. Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz Q.4 **08** using PLL 565. Section – II Q.5 Answer any three of the following question. 12 Design a timer using XR 2240 to generate a delay of 300 seconds. a) **b)** Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA. Draw and explain architecture of PLC. c) Compare between ON – OFF controller and proportional controller. Answer any one of the following question. **08** Q.6 a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926. b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 ° C. set point is 60 ° C and required full scale output is 10 V. Answer any one of the following question. Q.7 **08**

- a) Design 3  $\frac{1}{2}$  digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
- b) Draw and explain ladder diagram for bottle filling plant system.

Max. Marks: 56

Set

No. T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN** 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.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Seat

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

- 1) The time period of IC 2240 is given as \_
  - T = RCa)
  - T = 0.7 RCc)
- The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz 2) resolution is \_\_\_\_\_.
  - a) 4 7 c) d)

When trigger and reset both are applied simultaneously to IC 2240 then? 3)

- Trigger gets activated b) a)
  - Both a and b C) d)
- 4) The IC XR 2240 consist of \_\_\_\_\_.

a) LM 35

- a) 8 bit Counter 8 digit Counter c)
- 5) Which of the following temperature sensor has sensitivity 10 mv/° c
  - J-type thermocouple b) None
  - PT 100 d) c)
- 6) Which of following is self powered temperature sensor?
  - Thermocouple b) RTD a)
  - Thermistor d) None of these C)
- For input voltage range 0 2V, t2= 2000, required DVM display is. 7)
  - 2 digit a) b) 3 digit 3<sup>3</sup>⁄<sub>4</sub> digit  $3\frac{1}{2}$  digit d) c)
- For AC power control using DIAC and TRIAC using 230 V AC input, power 8) loss across. TRIAC is approximately % of load power.
  - a) 5 b) 10 c) 0.5 d) 1
- 9) For SCR, holding current is \_\_\_\_\_ than latching current.
  - Greater Less a) b)
  - both (a) and (c) C) equal d)

Max. Marks: 70

Marks: 14

Set

- T = 0.67 RC
- b)
  - d) None of the above
- 2 b) 8
  - Reset gets activated
    - None
    - b) 4 bit Counter
    - 4 digit Counter d)

### 10) In reverse blocking mode of a SCR, junction \_\_\_\_\_.

- a) J2 reverse & J1, J3 forward bias
- b) J3 forward bias & J1, J2 reverse bias
- c) J1, J3 reverse & J2 forward bias
- d) J1, J2 forward & J3 reverse bias
- 11) A single phase fully controlled converter with highly inductive load & freewheeling diode provides \_\_\_\_\_direction of voltage & \_\_\_\_\_direction of current.
  - a) Positive, Negative
- b) Positive, Positive

SLR-FM-244

Set Q

- c) Negative, Positive d) Negative, Negative
- Single phase fully controlled rectifier with inductive load is operated from 230 V, 50 Hz AC input & firing angle is 30°. Frequency of ripple in the output is \_\_\_\_\_ Hz.
  - a) 50

150

c)

- b) 100 d) 200
- 13) For Class A commutation series R-L-C circuit in series with SCR is \_\_\_\_\_.

b)

d)

- a) Under damped
- c) Critically damped
- 14) IC 1596 is \_\_\_\_
  - a)  $3_{1/2}$  digit DVM
  - c) PLL

b) Balanced modulator

Over damped

d) Timer

none

Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

Day & Date: Monday, 25-11-2019

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 if necessary.

#### Section – I Q.2 Answer any three of the following question. 12 a) Draw and explain two transistor analogy of an SCR. b) Explain Class - B type commutation of SCR. Draw and explain AC power control using DIAC and TRIAC for lamp c) dimmer. Explain the basic principle of working of balanced modulator with d) waveform. Q.3 Answer any one of the following question. **08** Draw construction and VI characteristics of SCR and explain its working. a) Draw and explain single phase controlled rectifier with center tapped b) transformer and resistive load. Derive expression for average output voltage & rms load voltage. Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz Q.4 **08** using PLL 565. Section – II Q.5 Answer any three of the following question. 12 Design a timer using XR 2240 to generate a delay of 300 seconds. a) b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA. Draw and explain architecture of PLC. c) Compare between ON – OFF controller and proportional controller. Answer any one of the following question. **08** Q.6 a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926. b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 ° C. set point is 60 ° C and required full scale output is 10 V. Answer any one of the following question. Q.7 **08**

- a) Design 3  $\frac{1}{2}$  digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
  - b) Draw and explain ladder diagram for bottle filling plant system.

Max. Marks: 56

Set

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

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.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Seat

No.

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

- Single phase fully controlled rectifier with inductive load is operated from 1) 230 V, 50 Hz AC input & firing angle is 30°. Frequency of ripple in the output is \_\_\_\_\_ Hz.
  - a) 50 b) 100 150 200 d) c)
- For Class A commutation series R-L-C circuit in series with SCR is 2)
  - a) Under damped
  - c) Critically damped
- 3) IC 1596 is . 3<sub>1/2</sub> digit DVM b) a)
  - PLL c)
- 4) The time period of IC 2240 is given as \_
  - T = RCa) T = 0.7 RCc)
- The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz 5) resolution is \_\_\_\_\_.
  - a) 4 b)
  - c) 7 8
- 6) When trigger and reset both are applied simultaneously to IC 2240 then?
  - Trigger gets activated a)
  - Both a and b c) d)
- The IC XR 2240 consist of \_\_\_\_\_. 7)
  - 8 bit Counter b) a) 8 digit Counter c)
- 8) Which of the following temperature sensor has sensitivity 10 mv/° c

b)

- J-type thermocouple LM 35 a) b)
- PT 100 c) d) None
- Which of following is self powered temperature sensor? 9) RTD
  - Thermocouple a)
  - C) Thermistor d) None of these

SLR-FM-244

Set

Max. Marks: 70

R



Marks: 14

- Over damped b)
- none d)
  - Balanced modulator
- d) Timer

  - T = 0.67 RCb)
- None of the above d)
- 2
  - d)
    - Reset gets activated b)
      - None
    - 4 bit Counter
      - 4 digit Counter
    - d)

- Set R
- 10) For input voltage range 0 2V, t2= 2000, required DVM display is.
  - 2 digit b) 3 digit
  - c) 3 <sup>1</sup>/<sub>2</sub> digit d) 3 <sup>3</sup>/<sub>4</sub> digit
- 11) For AC power control using DIAC and TRIAC using 230 V AC input, power loss across. TRIAC is approximately \_\_\_\_\_% of load power.
   a) 5
   b) 10
  - c) 0.5 d) 1
- 12) For SCR, holding current is \_\_\_\_\_ than latching current.
  - Greater b) Less
  - c) equal d) both (a) and (c)
- 13) In reverse blocking mode of a SCR, junction \_\_\_\_\_.
  - a) J2 reverse & J1, J3 forward bias
  - b) J3 forward bias & J1, J2 reverse bias
  - c) J1, J3 reverse & J2 forward bias
  - d) J1, J2 forward & J3 reverse bias
- 14) A single phase fully controlled converter with highly inductive load & freewheeling diode provides \_\_\_\_\_direction of voltage & \_\_\_\_\_direction of current.
  - a) Positive, Negative

a)

a)

- c) Negative, Positive
- b) Positive, Positive
- d) Negative, Negative

Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

Day & Date: Monday, 25-11-2019

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 if necessary.

### Section – I

#### Q.2 Answer any three of the following question. 12 a) Draw and explain two transistor analogy of an SCR. Explain Class - B type commutation of SCR. b) Draw and explain AC power control using DIAC and TRIAC for lamp c) dimmer. Explain the basic principle of working of balanced modulator with d) waveform. Q.3 Answer any one of the following question. **08** Draw construction and VI characteristics of SCR and explain its working. a) Draw and explain single phase controlled rectifier with center tapped b) transformer and resistive load. Derive expression for average output voltage & rms load voltage. Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz Q.4 **08** using PLL 565. Section – II Q.5 Answer any three of the following question. 12 Design a timer using XR 2240 to generate a delay of 300 seconds. a) b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA. Draw and explain architecture of PLC. c) Compare between ON – OFF controller and proportional controller. Answer any one of the following question. **08** Q.6 a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926. b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 ° C. set point is 60 ° C and required full scale output is 10 V. Answer any one of the following question. Q.7 **08**

- a) Design 3  $\frac{1}{2}$  digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
- b) Draw and explain ladder diagram for bottle filling plant system.

Max. Marks: 56

Set

# T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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.

**ELECTRONICS APPLICATIONS & SYSTEM DESIGN** 

- 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 and rewrite the sentence. 14

- When trigger and reset both are applied simultaneously to IC 2240 then? 1)
  - Trigger gets activated a)
  - Both a and b c) d)
- The IC XR 2240 consist of \_\_\_\_\_. 2)
  - a) 8 bit Counter b)
  - c) 8 digit Counter d) 4 digit Counter
- 3) Which of the following temperature sensor has sensitivity 10 mv/° c
  - LM 35 J-type thermocouple a) b)
  - c) PT 100 d) None

#### 4) Which of following is self powered temperature sensor?

- Thermocouple b) RTD a)
- Thermistor d) None of these c)
- For input voltage range 0 2V, t2= 2000, required DVM display is. 5) 3 digit
  - 2 digit a) b)
  - 3 <sup>1</sup>/<sub>2</sub> digit d) 3 <sup>3</sup>⁄<sub>4</sub> digit c)

For AC power control using DIAC and TRIAC using 230 V AC input, power 6) loss across. TRIAC is approximately \_\_\_\_\_ % of load power.

- a) 5 10 b) c) 0.5 d) 1
- For SCR, holding current is \_\_\_\_\_ than latching current. 7)
  - a) Greater b)
  - d) c) equal both (a) and (c)
- In reverse blocking mode of a SCR, junction . 8)
  - J2 reverse & J1, J3 forward bias a)
  - b) J3 forward bias & J1, J2 reverse bias
  - J1, J3 reverse & J2 forward bias c)
  - J1, J2 forward & J3 reverse bias d)





Max. Marks: 70

- Marks: 14
- Reset gets activated
- b) None

Less

- 4 bit Counter

			Set	S
9)	A single phase fully controlled converting diode providesdi current.	rter w rectio	ith highly inductive load & n of voltage &direction of	
	<ul><li>a) Positive, Negative</li><li>c) Negative, Positive</li></ul>	b) d)	Positive, Positive Negative, Negative	
10)	Single phase fully controlled rectifier 230 V, 50 Hz AC input & firing angle output is Hz.	with i is 30 <sup>c</sup>	nductive load is operated from . Frequency of ripple in the	
	a) 50 c) 150	b) d)	100 200	
11)	<ul><li>For Class A commutation series R-L-</li><li>a) Under damped</li><li>c) Critically damped</li></ul>	-C ciro b) d)	cuit in series with SCR is Over damped none	
12)	IC 1596 is a) 3 <sub>1/2</sub> digit DVM c) PLL	b) d)	Balanced modulator Timer	
13)	The time period of IC 2240 is given a a) $T = RC$ c) $T = 0.7 RC$	b) d)	T = 0.67 RC None of the above	
14)	The number of IC 74926 required to resolution is	count	frequency of 1 MHz with 0.1 Hz	
	a) 4 c) 7	b) d)	2 8	

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

Day & Date: Monday, 25-11-2019

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 if necessary.

### Section – I

#### Q.2 Answer any three of the following question. 12 a) Draw and explain two transistor analogy of an SCR. b) Explain Class - B type commutation of SCR. c) Draw and explain AC power control using DIAC and TRIAC for lamp dimmer. Explain the basic principle of working of balanced modulator with d) waveform. Q.3 Answer any one of the following question. **08** Draw construction and VI characteristics of SCR and explain its working. a) Draw and explain single phase controlled rectifier with center tapped b) transformer and resistive load. Derive expression for average output voltage & rms load voltage. Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz Q.4 **08** using PLL 565. Section – II Q.5 Answer any three of the following question. 12 Design a timer using XR 2240 to generate a delay of 300 seconds. a) b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA. Draw and explain architecture of PLC. c) Compare between ON – OFF controller and proportional controller. Answer any one of the following question. 80 Q.6 a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926. b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 ° C. set point is 60 ° C and required full scale output is 10 V. Answer any one of the following question. Q.7 **08** a) Design 3 $\frac{1}{2}$ digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.

b) Draw and explain ladder diagram for bottle filling plant system.

Set

Max. Marks: 56

## Set T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

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.

**OPTICAL COMMUNICATION** 

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

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

- The total number of guided modes for a step index fiber is approximately given by expression, where V is normalized frequency as \_\_\_\_\_.
  - a) M = V2/2 b) M = V2/3
  - c) M = V/2 d) M = V2/4

## 2) Multimode graded index fibers exhibit for less intermodal dispersion than multimode step index fibers due to their \_\_\_\_\_.

- a) Structurec) Refractive index profile
  - b) Acceptance angled) Multipath reflection
- 3) When angle of refraction is 90° and the refracted ray emerges parallel to interface between dielectrics the angle of incidence must be less than 90°. This limiting case is known as

b)

d)

- a) Critical angle b) Acceptance angle
- c) Numerical aperture d) Skew ray
- 4) The internal quantum efficiency of LED decreases with \_\_\_\_\_.
  - a) Increase in temp
  - c) Increase in pressure
- 5) Laser is \_\_\_\_\_ optical source
  - a) Non-coherent
  - c) Both a) and b) d) None of these
- 6) Which of the following considerations is important when deciding between using a diode laser or an LED?
  - a) Response time b) Power levels
  - c) Temperature sensitivity d) Failure characteristics
- The cutoff wavelength is the wavelength above which a particular fiber becomes \_\_\_\_\_.
  - a) Multimoded b) Single moded
  - c) Not usable d) Both a) and b)
- 8) The requirement of detector is \_\_\_\_\_.
  - a) High fidelity b) Larger size
  - c) More numerical aperture d) All of above





Max. Marks: 70

Marks: 14

14

Coherent

Decrease in temp

None of these

b) Coherent

- 9) A photodiode has a quantum efficiency of 70% when photos of energy 1.8x10<sup>-19</sup> are incident upon it, then the responsivity of the photodiode is
  - a) 0.694 b) 0.723
  - c) 0.369 d) 0.623
  - Wavelength division multiplexing is same as \_\_\_\_\_ \_\_. a) FDM TDM b)
  - c) DWDM d) None
- In optical communication system, the light detector is: \_\_\_\_\_. 11)
  - a) Avalanche Photo Diode (APD)
  - b) Positive Intrinsic Negative (PIN) diode
  - c) Phototransistor
  - d) Either a or b

10)

#### Impact Ionization phenomenon occur in \_\_\_\_ 12)

- a) p-n photodiode b) avalanche photodiode
- c) p-i-n photodiode none of these d)
- The basic performance of WDM is determined by \_\_\_\_\_ 13)
  - a) Insertion loss

c) Noise added in channel

- Transmission loss b) All of the Above d)
- 14) The electron hole pairs generated in a photodiode are separated by the .
  - Magnetic field a)
  - c)
- b) Electric field
- Static field
- d) **Depletion region**





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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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.

### Section – I

### Q.2 Answer any three.

- a) List the characteristic of Injection Laser.
- **b)** Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- c) A 15 km optical fiber link uses fiber with a loss of 1.5 dB km<sup>-1</sup>. The fiber is jointed every kilometre with connectors which give an attenuation of 0.8 dB each. Determine the minimum mean optical power which must be launched into the fiber in order to maintain a mean optical power level of  $0.3 \,\mu\text{W}$  at the detector.
- d) Define the normalized frequency for an optical fiber and explain its use in the determination of the number of guided modes propagating within a step index fiber. A step index fiber in air has a numerical aperture of 0.16, a core refractive index of 1.45 and a core diameter of 60 µm. Determine the normalized frequency for the fiber when light at a wavelength of 0.9 µm is transmitted. Further, estimate the number of guided modes propagating in the fiber.

### Q.3 Answer any two.

- a) Define the term LED power, efficiency and drive the expression for them.
- **b)** Two step index fibers exhibit the following parameters:
  - 1) a multimode fiber with a core refractive index of 1.500, a relative refractive index difference of 3% and an operating wavelength of 0.82 μm;
  - 2) an 8 µm core diameter single-mode fiber with a core refractive index the same as(1), a relative refractive index difference of 0.3% and an operating wavelength of 1.55 µm. Estimate the critical radius of curvature at which large bending losses occur in both cases.
- c) Explain fiber alignment and joint loss.

Max. Marks: 56

16

Set P

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12

### Section – II

### Q.4 Answer any three

- a) Explain detection process in PIN photodiode. Compare the device with APD photodiode.
- **b)** Explain the concept of SONET.
- c) The quantum efficiency of particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9  $\mu$ m. When the incident optical power is

0.5  $\mu$ W, the output current from the device (after avalanche gain) is 11  $\mu$ A. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

### Q.5 Answer any two.

- a) A p-n photodiode has a quantum efficiency of 50% at a wavelength of 0.9 μm. Calculate:
  - 1) its responsivity at 0.9 μm;
  - 2) the received optical power if the mean photocurrent is  $10^{-6}$  A
  - 3) the corresponding number of received photons at this wavelength.
- **b)** Briefly explain the WDM.
- c) Explain the transmitter and receiver design for optical communication.



16

SLR-FM-245 Set P

#### **Electronics & Telecommunication Engineering OPTICAL COMMUNICATION** 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) Figures to the right indicate full marks. 3) Assume suitable data if necessary. MCQ/Objective Type Questions Choose the correct alternatives from the options and rewrite the sentence. The requirement of detector is \_\_\_\_\_ 1) High fidelity b) Larger size a) More numerical aperture d) All of above C) A photodiode has a quantum efficiency of 70% when photos of energy 2) 1.8x10<sup>-19</sup> are incident upon it, then the responsivity of the photodiode is 0.694 0.723 a) b) 0.369 d) 0.623 C) Wavelength division multiplexing is same as 3) a) FDM b) TDM c) DWDM d) None

- In optical communication system, the light detector is: 4)
  - a) Avalanche Photo Diode (APD)
  - b) Positive Intrinsic Negative (PIN) diode
  - c) Phototransistor
  - d) Either a or b

#### 5) Impact Ionization phenomenon occur in \_

- p-n photodiode avalanche photodiode a) b)
- c) p-i-n photodiode d) none of these
- The basic performance of WDM is determined by 6)
  - Transmission loss Insertion loss a) b)
  - Noise added in channel d) All of the Above C)
- 7) The electron hole pairs generated in a photodiode are separated by the .
  - Magnetic field a)
  - C) Static field

- Electric field b)
- d) **Depletion region**

**SLR-FM-245** 



Max. Marks: 70

Marks: 14

14

**Duration: 30 Minutes** 

Q.1

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- 8) The total number of guided modes for a step index fiber is approximately given by expression, where V is normalized frequency as
  - M = V2/2M = V2/3a) b) M = V / 2d) M = V2/4c)
- 9) Multimode graded index fibers exhibit for less intermodal dispersion than multimode step index fibers due to their \_\_\_\_
  - a) Structure
- Acceptance angle b)

Acceptance angle

- Refractive index profile d) Multipath reflection
- When angle of refraction is 90° and the refracted ray emerges parallel to 10) interface between dielectrics the angle of incidence must be less than 90°. This limiting case is known as

b)

d)

d)

a) Critical angle

c)

12)

- c) Numerical aperture
- The internal quantum efficiency of LED decreases with \_\_\_\_\_ 11) .
  - a) Increase in temp
  - c) Increase in pressure
  - Laser is optical source
    - a) Non-coherent

    - c) Both a) and b)
- b) Coherent
- d) None of these
- 13) Which of the following considerations is important when deciding between using a diode laser or an LED?
  - a) Response time
- b) Power levels

Failure characteristics

- c) Temperature sensitivity
- The cutoff wavelength is the wavelength above which a particular 14) fiber becomes
  - a) Multimoded
  - c) Not usable

- Single moded b)
- d) Both a) and b)

b) Decrease in temp None of these d)

Skew ray

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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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.

### Section – I

### Q.2 Answer any three.

- a) List the characteristic of Injection Laser.
- **b)** Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- c) A 15 km optical fiber link uses fiber with a loss of 1.5 dB km<sup>-1</sup>. The fiber is jointed every kilometre with connectors which give an attenuation of 0.8 dB each. Determine the minimum mean optical power which must be launched into the fiber in order to maintain a mean optical power level of  $0.3 \,\mu\text{W}$  at the detector.
- d) Define the normalized frequency for an optical fiber and explain its use in the determination of the number of guided modes propagating within a step index fiber. A step index fiber in air has a numerical aperture of 0.16, a core refractive index of 1.45 and a core diameter of 60 µm. Determine the normalized frequency for the fiber when light at a wavelength of 0.9 µm is transmitted. Further, estimate the number of guided modes propagating in the fiber.

### Q.3 Answer any two.

- a) Define the term LED power, efficiency and drive the expression for them.
- **b)** Two step index fibers exhibit the following parameters:
  - **1)** a multimode fiber with a core refractive index of 1.500, a relative refractive index difference of 3% and an operating wavelength of 0.82 μm;
  - 2) an 8 µm core diameter single-mode fiber with a core refractive index the same as(1), a relative refractive index difference of 0.3% and an operating wavelength of 1.55 µm. Estimate the critical radius of curvature at which large bending losses occur in both cases.
- c) Explain fiber alignment and joint loss.

Max. Marks: 56

16

12

### Section – II

### Q.4 Answer any three

- a) Explain detection process in PIN photodiode. Compare the device with APD photodiode.
- **b)** Explain the concept of SONET.
- c) The quantum efficiency of particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9  $\mu$ m. When the incident optical power is

0.5  $\mu$ W, the output current from the device (after avalanche gain) is 11  $\mu$ A. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

### Q.5 Answer any two.

- a) A p-n photodiode has a quantum efficiency of 50% at a wavelength of 0.9 μm. Calculate:
  - 1) its responsivity at 0.9  $\mu$ m;
  - 2) the received optical power if the mean photocurrent is  $10^{-6}$  A
  - 3) the corresponding number of received photons at this wavelength.
- **b)** Briefly explain the WDM.
- c) Explain the transmitter and receiver design for optical communication.



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SLR-FM-245 Set Q

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Day Time	& Date : 10:0	e: Tuesday, 26-11-2019 0 AM To 01:00 PM		Max. Mark	s: 70
Instr	uctio	ns: 1) Q. No. 1 is compulsory and sh	nould b	be solved in first 30 minutes in ans	wer
		роок. 2) Figures to the right indicate fu 3) Assume suitable data if neces	ll mari sary.	KS.	
		MCQ/Objective T	уре	Questions	
Dura	tion: 3	30 Minutes		Mark	s: 14
Q.1	Cho sent	ose the correct alternatives from t rence	he op	tions and rewrite the	14
	1)	Laser is optical source a) Non-coherent c) Both a) and b)	b) d)	Coherent None of these	
	2)	Which of the following consideratio between using a diode laser or an a) Response time c) Temperature sensitivity	ns is i LED? b) d)	mportant when deciding Power levels Failure characteristics	
	3)	The cutoff wavelength is the wavelength becomes a) Multimoded c) Not usable	ength b) d)	above which a particular Single moded Both a) and b)	
	4)	The requirement of detector is a) High fidelity c) More numerical aperture	 b) d)	Larger size All of above	
	5)	A photodiode has a quantum efficient 1.8x10 <sup>-19</sup> are incident upon it, then	ency o the re	f 70% when photos of energy sponsivity of the photodiode is	
		a) 0.694 c) 0.369	b) d)	0.723 0.623	
	6)	Wavelength division multiplexing is a) FDM c) DWDM	same b) d)	e as TDM None	
	7)	<ul> <li>In optical communication system, the analysis of the</li></ul>	he ligh I) diod	it detector is: e	
	8)	Impact Ionization phenomenon occ a) p-n photodiode c) p-i-n photodiode	ur in _ b) d)	 avalanche photodiode none of these	

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The basic performance of WDM is c a) Insertion loss c) Noise added in channel	letern b) d)	nined by Transmission loss All of the Above
The electron hole pairs generated in by the a) Magnetic field c) Static field	n a ph b) d)	notodiode are separated Electric field Depletion region
The total number of guided modes f approximately given by expression, as a) M = V2 /2 c) M = V /2	or a s wher b) d)	step index fiber is e V is normalized frequency M = V2 /3 M = V2 /4
Multimode graded index fibers exhib multimode step index fibers due to t a) Structure c) Refractive index profile	bit for heir _ b) d)	less intermodal dispersion than  Acceptance angle Multipath reflection
<ul> <li>When angle of refraction is 90° and interface between dielectrics the ang 90°. This limiting case is known as</li> <li>a) Critical angle</li> <li>c) Numerical aperture</li> </ul>	the regle of	efracted ray emerges parallel to incidence must be less than - Acceptance angle Skew ray

The internal quantum efficiency of LED decreases with \_\_\_\_\_.a) Increase in tempb) Decrease in tempc) Increase in pressured) None of these 14)

9)

10)

11)

12)

13)

Seat	
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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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.

### Section – I

### Q.2 Answer any three.

- a) List the characteristic of Injection Laser.
- **b)** Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- c) A 15 km optical fiber link uses fiber with a loss of 1.5 dB km<sup>-1</sup>. The fiber is jointed every kilometre with connectors which give an attenuation of 0.8 dB each. Determine the minimum mean optical power which must be launched into the fiber in order to maintain a mean optical power level of  $0.3 \,\mu\text{W}$  at the detector.
- d) Define the normalized frequency for an optical fiber and explain its use in the determination of the number of guided modes propagating within a step index fiber. A step index fiber in air has a numerical aperture of 0.16, a core refractive index of 1.45 and a core diameter of 60 µm. Determine the normalized frequency for the fiber when light at a wavelength of 0.9 µm is transmitted. Further, estimate the number of guided modes propagating in the fiber.

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- a) Define the term LED power, efficiency and drive the expression for them.
- **b)** Two step index fibers exhibit the following parameters:
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  - 2) an 8 µm core diameter single-mode fiber with a core refractive index the same as(1), a relative refractive index difference of 0.3% and an operating wavelength of 1.55 µm. Estimate the critical radius of curvature at which large bending losses occur in both cases.
- c) Explain fiber alignment and joint loss.

Max. Marks: 56

12

16



### Section – II

### Q.4 Answer any three

- a) Explain detection process in PIN photodiode. Compare the device with APD photodiode.
- **b)** Explain the concept of SONET.
- c) The quantum efficiency of particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9  $\mu$ m. When the incident optical power is

0.5  $\mu$ W, the output current from the device (after avalanche gain) is 11  $\mu$ A. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

### Q.5 Answer any two.

- a) A p-n photodiode has a quantum efficiency of 50% at a wavelength of 0.9 μm. Calculate:
  - 1) its responsivity at 0.9  $\mu$ m;
  - 2) the received optical power if the mean photocurrent is  $10^{-6}$  A
  - 3) the corresponding number of received photons at this wavelength.
- **b)** Briefly explain the WDM.
- c) Explain the transmitter and receiver design for optical communication.



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## SLR-FM-245 Set R

			OPTICAL COMM	IUNI	CATION
Day & Time	& Date : 10:00	e: Tu D AN	iesday, 26-11-2019 I To 01:00 PM		Max. Marks: 70
Instr	uction	<b>is:</b> 1	) Q. No. 1 is compulsory and sho	ould b	e solved in first 30 minutes in answer
		23	<ul> <li>2) Figures to the right indicate full</li> <li>3) Assume suitable data if necess</li> </ul>	mark ary.	S.
			MCQ/Objective Ty	vpe (	Questions
Dura	tion: 3	0 Mi	nutes	-	Marks: 14
Q.1	Choo sente	ose t ence	the correct alternatives from the	e opt	tions and rewrite the 14
	1)	a)	FDM	b)	TDM
		c)	DWDM	d)	None
	2)	In c a) b) c) d)	optical communication system, the Avalanche Photo Diode (APD) Positive Intrinsic Negative (PIN) Phototransistor Either a or b	e light diode	t detector is:
	3)	lmp a) c)	pact Ionization phenomenon occu p-n photodiode p-i-n photodiode	r in _ b) d)	avalanche photodiode none of these
	4)	Th∉ a) c)	e basic performance of WDM is d Insertion loss Noise added in channel	eterm b) d)	ined by Transmission loss All of the Above
	5)	The by f a) c)	e electron hole pairs generated in the Magnetic field Static field	a ph b) d)	otodiode are separated Electric field Depletion region
	6)	The app as a) c)	e total number of guided modes for proximately given by expression, M = V2/2 M = V/2	or a s where b) d)	tep index fiber is e V is normalized frequency M = V2 /3 M = V2 /4
	7)	, Mu mu a)	Itimode graded index fibers exhib Itimode step index fibers due to tl Structure	ít for neir _ b)	less intermodal dispersion than  Acceptance angle

c) Refractive index profile d) Multipath reflection

### SLR-FM-245

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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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8)	Wh inte 90° a) c)	en angle of refraction is 90° and erface between dielectrics the ang c. This limiting case is known as _ Critical angle Numerical aperture	the re gle of b) d)	fracted ray emerges parallel to incidence must be less than Acceptance angle Skew ray
9)	The a) c)	e internal quantum efficiency of L Increase in temp Increase in pressure	ED d€ b) d)	ecreases with Decrease in temp None of these
10)	Las a) c)	ser is optical source Non-coherent Both a) and b)	b) d)	Coherent None of these
11)	Wh bet a) c)	ich of the following consideration ween using a diode laser or an Ll Response time Temperature sensitivity	s is in ED? b) d)	nportant when deciding Power levels Failure characteristics
12)	The fibe a) c)	e cutoff wavelength is the waveler er becomes Multimoded Not usable	ngth a b) d)	above which a particular Single moded Both a) and b)
13)	The a) c)	e requirement of detector is High fidelity More numerical aperture	 b) d)	Larger size All of above
14)	Aр	hotodiode has a quantum efficier	ncv of	70% when photos of energy

A photodiode has a quantum efficiency of 70% when photos of energy 1.8x10<sup>-19</sup> are incident upon it, then the responsivity of the photodiode is

	·		
a)	0.694	b)	0.723
c)	0.369	d)	0.623

SLR-FM-245

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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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.

### Section – I

### Q.2 Answer any three.

- a) List the characteristic of Injection Laser.
- **b)** Using simple ray theory, describe the mechanism for the transmission of light within an optical fiber.
- c) A 15 km optical fiber link uses fiber with a loss of 1.5 dB km<sup>-1</sup>. The fiber is jointed every kilometre with connectors which give an attenuation of 0.8 dB each. Determine the minimum mean optical power which must be launched into the fiber in order to maintain a mean optical power level of  $0.3 \,\mu\text{W}$  at the detector.
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### Q.3 Answer any two.

- a) Define the term LED power, efficiency and drive the expression for them.
- **b)** Two step index fibers exhibit the following parameters:
  - 1) a multimode fiber with a core refractive index of 1.500, a relative refractive index difference of 3% and an operating wavelength of 0.82 μm;
  - 2) an 8 µm core diameter single-mode fiber with a core refractive index the same as(1), a relative refractive index difference of 0.3% and an operating wavelength of 1.55 µm. Estimate the critical radius of curvature at which large bending losses occur in both cases.
- c) Explain fiber alignment and joint loss.

Max. Marks: 56

12

16

9

Set S

### Section – II

### Q.4 Answer any three

- a) Explain detection process in PIN photodiode. Compare the device with APD photodiode.
- **b)** Explain the concept of SONET.
- c) The quantum efficiency of particular silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9  $\mu$ m. When the incident optical power is

0.5  $\mu$ W, the output current from the device (after avalanche gain) is 11  $\mu$ A. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

### Q.5 Answer any two.

- a) A p-n photodiode has a quantum efficiency of 50% at a wavelength of 0.9 μm. Calculate:
  - 1) its responsivity at 0.9  $\mu$ m;
  - 2) the received optical power if the mean photocurrent is  $10^{-6}$  A
  - 3) the corresponding number of received photons at this wavelength.
- **b)** Briefly explain the WDM.
- c) Explain the transmitter and receiver design for optical communication.



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## SLR-FM-245 Set S

## T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.

- 2) Assume suitable data if necessary.
- 4) 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
  - GSM stands for 1)
    - a) Global service for mobile
    - Group of special machines c)
  - 2) The scheme in which each cell is allocated a predetermined set of voice channels is called as \_\_\_\_\_.
    - a) Dynamic channel
    - Demand channel c)
  - 3) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
    - b) CDMA TDMA a)
    - C) **FDMA** d) FGMA
  - The antenna which attempts to direct all its energy in a particular direction 4) is called as a

d)

- Directional Antenna a)
- Propagation Antenna c)

b) One to one Antenna

Propagation mode a)

Reflection is?

5)

- c) Spread spectrum
- b) Propagation mechanism d) None of the above

Single Direction Antenna

b) Global scope for mobile d) Global system for mobile

b) Fixed channel

d) Forward channel

- Spot Beam antenna is used in which of the following multiple access 6) technique?
  - TDMA b) FDMA a)
  - C) **SDMA** d) Both (a) and (b)
- 7) The model considered for both direct path and ground reflected propagation path between T-R is
  - Hata model a)

C)

- Two ray model b) d) Okumura model
- Free space model
- 8) Modulation technique used in CDMA 2000 is \_\_\_\_\_.
  - Uplink QPSK, Downlink BPSK a)
  - Uplink BPSK, Downlink QPSK b)
  - Uplink BPSK, Downlink BPSK c)
  - None of the above d)

## **MOBILE COMMUNICATION** Max. Marks: 70

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Marks: 14

Set

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Set P

- 9) In GSM the downlink frequency band is \_\_\_\_\_
  - a) 890-915 MHz c) 890-935 MHz
- b) 935-960 MHz d) 917-945 MHz
- An interface which connects a BTS to a BSC is called \_\_\_\_\_ interface. 10)
  - a) Channel Interface
- b) Signaling Interface
- c) Abis Interface
- d) None of these
- 11) IMT 2000 stands for \_\_\_\_
  - a) International Mobile Telecommunication
  - Interim Mobile Telecommunication b)
  - International Mobile Technology c)
  - None of these d)

a)

- 12) What is modulation technique used in IS-95 CDMA Reverse Channel?
  - QPSK b) OPQSK
  - C) MSK d) FSK
- GSM is a \_\_\_\_\_ generation cellular system. 13)
  - b) Second
  - c) Third d) None of these
- Each group of 26 consecutive TDMA frames is called a \_\_\_\_\_. 14)
  - a) Multi frame

a) First

b) Mini frame

Mainframe c)

d) All of the above

### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION

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 if necessary.

### Section – I

### Q.2 Attempt any four of the following.

- a) Explain the process of Handoff in cellular system.
- b) Find the far field distance for an antenna with maximum dimension of 1meter and operating frequency of 900 MHz.
- c) Explain the concept of interference and system capacity.
- d) What is diffraction? Explain knife edge diffraction.
- e) Describe TDMA technique in detail and compare it with FDMA.

### Q.3 Attempt any two of the following.

- a) Explain in brief different methods used to improve capacity of cellular system.
- b) For given path loss exponent (i) n = 4 and (ii) n = 3 find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal-to-interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- c) Explain ground reflection model (two ray model). Also prove that the  $A = (2 h_t h_r)/d$ (Where A - path difference between the Line of sight and ground reflected

(Where  $\blacktriangle$  - path difference between the Line of sight and ground reflected path)

### Section – II

### Q.4 Attempt any four of the following.

- a) Explain with neat block diagram forward channels in W-CDMA.
- b) Explain in detail forward IS 95-CDMA link structure.
- c) What is Handoff? Explain Handoff in GSM.
- d) Explain GSM frames in detail.
- e) Explain mobile call termination sequence in GSM.

### Q.5 Attempt any two of the following.

- a) Explain 4G/LTE architecture.
- b) Draw and explain GSM signaling architecture in detail.
- c) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

Max. Marks: 56

**SLR-FM-246** 

Set

12

16

16

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Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MOBILE COMMUNICATION**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.

- 2) Assume suitable data if necessary.
- 4) 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

- Modulation technique used in CDMA 2000 is .
  - Uplink QPSK, Downlink BPSK a)
  - Uplink BPSK, Downlink QPSK b)
  - Uplink BPSK, Downlink BPSK c)
  - d) None of the above

#### 2) In GSM the downlink frequency band is \_\_\_\_\_.

- 890-915 MHz b) 935-960 MHz a)
- 890-935 MHz d) 917-945 MHz c)
- An interface which connects a BTS to a BSC is called interface. 3)
  - a) Channel Interface b) Signaling Interface d) None of these
  - c) Abis Interface
- IMT 2000 stands for 4)
  - a) International Mobile Telecommunication
  - Interim Mobile Telecommunication b)
  - International Mobile Technology c)
  - d) None of these

#### What is modulation technique used in IS-95 CDMA Reverse Channel? 5)

- QPSK b) OPQSK a)
- d) FSK C) MSK
- GSM is a \_\_\_\_\_ generation cellular system. 6)
  - a) First b) Second
  - Third d) None of these c)
- Each group of 26 consecutive TDMA frames is called a . 7) b) Mini frame
  - Multi frame a)
  - Mainframe C)
- d) All of the above

- 8) GSM stands for
- I stands for \_\_\_\_\_. Global service for mobile a)
  - C)
- b) Global scope for mobile
- d) Global system for mobile

Max. Marks: 70

Set

Marks: 14

- 9) The scheme in which each cell is allocated a predetermined set of voice channels is called as b) Fixed channel
  - Dynamic channel a)
  - Demand channel C)
- 10) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
  - a) TDMA b) CDMA
  - **FDMA** d) FGMA c)
- 11) The antenna which attempts to direct all its energy in a particular direction is called as a .
  - a) Directional Antenna c) Propagation Antenna
- b) One to one Antenna

d) Forward channel

d) Single Direction Antenna

12) Reflection is?

c)

C)

- a) Propagation mode Spread spectrum
- b) Propagation mechanism
- d) None of the above
- Spot Beam antenna is used in which of the following multiple access 13) technique?
  - a) TDMA

SDMA

- b) FDMA
- d) Both (a) and (b)
- 14) The model considered for both direct path and ground reflected propagation path between T-R is \_\_\_\_
  - Hata model a) c)

- b) Two ray model
- Free space model
- d) Okumura model

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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

### Section - I

### Q.2 Attempt any four of the following.

- a) Explain the process of Handoff in cellular system.
- b) Find the far field distance for an antenna with maximum dimension of 1meter and operating frequency of 900 MHz.
- c) Explain the concept of interference and system capacity.
- d) What is diffraction? Explain knife edge diffraction.
- e) Describe TDMA technique in detail and compare it with FDMA.

### Q.3 Attempt any two of the following.

- a) Explain in brief different methods used to improve capacity of cellular system.
- b) For given path loss exponent (i) n = 4 and (ii) n = 3 find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal-to-interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- c) Explain ground reflection model (two ray model). Also prove that the  ${f A}=(2\ h_th_r)/d$

(Where  $\blacktriangle$ - path difference between the Line of sight and ground reflected path)

#### Section - II

#### Q.4 Attempt any four of the following.

- a) Explain with neat block diagram forward channels in W-CDMA.
- b) Explain in detail forward IS 95-CDMA link structure.
- c) What is Handoff? Explain Handoff in GSM.
- d) Explain GSM frames in detail.
- e) Explain mobile call termination sequence in GSM.

#### Q.5 Attempt any two of the following.

- a) Explain 4G/LTE architecture.
- b) Draw and explain GSM signaling architecture in detail.
- c) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

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Max. Marks: 56

16

12

16

12

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MOBILE COMMUNICATION**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.

- 2) Assume suitable data if necessary.
- 4) 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
  - Reflection is? 1)
    - Propagation mode a)
    - c) Spread spectrum
  - 2) Spot Beam antenna is used in which of the following multiple access technique?
    - TDMA b) FDMA a) c) **SDMA**
  - 3) The model considered for both direct path and ground reflected propagation path between T-R is
    - b) Two ray model Hata model a)
      - c) Free space model d) Okumura model
  - Modulation technique used in CDMA 2000 is \_\_\_\_\_. 4)
    - a) Uplink QPSK, Downlink BPSK
    - Uplink BPSK, Downlink QPSK b)
    - Uplink BPSK, Downlink BPSK c)
    - d) None of the above

In GSM the downlink frequency band is \_ 5)

- a) 890-915 MHz b) 935-960 MHz
- c) 890-935 MHz d) 917-945 MHz

An interface which connects a BTS to a BSC is called \_\_\_\_\_ interface. 6)

- b) Signaling Interface a) Channel Interface
- c) Abis Interface d) None of these
- 7) IMT 2000 stands for \_\_\_\_\_
  - International Mobile Telecommunication a)
  - b) Interim Mobile Telecommunication
  - International Mobile Technology c)
  - d) None of these

#### What is modulation technique used in IS-95 CDMA Reverse Channel? 8)

- a) QPSK b) OPQSK
- MSK d) FSK c)
- 9) GSM is a generation cellular system. b) Second
  - a) First
  - Third c)

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Max. Marks: 70

Marks: 14



Seat No.

- d) Both (a) and (b)

d) None of the above

b) Propagation mechanism

d) None of these

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10) Each group of 26 consecutive TDMA frames is called a \_\_\_\_\_. b) Mini frame

.

- Multi frame a)
- c) Mainframe
- 11) GSM stands for
  - a) Global service for mobile
  - c) Group of special machines
- b) Global scope for mobile
- d) Global system for mobile
- The scheme in which each cell is allocated a predetermined set of voice 12) channels is called as \_\_\_\_\_.
  - a) Dynamic channel
- b) Fixed channel

d) All of the above

- Demand channel c)
- d) Forward channel
- 13) In \_\_\_\_\_ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
  - TDMA b) CDMA a)
  - d) FGMA C) FDMA
- 14) The antenna which attempts to direct all its energy in a particular direction is called as a \_\_\_ \_\_\_\_.
  - a) Directional Antenna
  - c) Propagation Antenna
- b) One to one Antenna
- d) Single Direction Antenna
### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION

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 if necessary.

### Section – I

### Q.2 Attempt any four of the following.

- a) Explain the process of Handoff in cellular system.
- b) Find the far field distance for an antenna with maximum dimension of 1meter and operating frequency of 900 MHz.
- c) Explain the concept of interference and system capacity.
- d) What is diffraction? Explain knife edge diffraction.
- e) Describe TDMA technique in detail and compare it with FDMA.

### Q.3 Attempt any two of the following.

- a) Explain in brief different methods used to improve capacity of cellular system.
- b) For given path loss exponent (i) n = 4 and (ii) n = 3 find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal-to-interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- c) Explain ground reflection model (two ray model). Also prove that the  $A = (2 h_t h_r)/d$  (Where A path difference between the Line of sight and ground reflection

(Where ▲- path difference between the Line of sight and ground reflected path)

### Section – II

### Q.4 Attempt any four of the following.

- a) Explain with neat block diagram forward channels in W-CDMA.
- b) Explain in detail forward IS 95-CDMA link structure.
- c) What is Handoff? Explain Handoff in GSM.
- d) Explain GSM frames in detail.
- e) Explain mobile call termination sequence in GSM.

### Q.5 Attempt any two of the following.

- a) Explain 4G/LTE architecture.
- b) Draw and explain GSM signaling architecture in detail.
- c) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

Max. Marks: 56

Set

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12

16

16

Set

Max. Marks: 70

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MOBILE COMMUNICATION**

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.

- 2) Assume suitable data if necessary.
- 4) Figures to right indicate full marks.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Seat

No.

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

- An interface which connects a BTS to a BSC is called interface. 1)
  - a) Channel Interface b) Signaling Interface d) None of these
  - c) Abis Interface
- 2) IMT 2000 stands for
  - International Mobile Telecommunication a)
  - Interim Mobile Telecommunication b)
  - International Mobile Technology C)
  - None of these d)

QPSK

What is modulation technique used in IS-95 CDMA Reverse Channel? 3)

- b) OPQSK
- C) MSK d) FSK
- 4) GSM is a \_\_\_\_\_ generation cellular system.
  - a) First c) Third

a)

- b) Second
- d) None of these
- 5) Each group of 26 consecutive TDMA frames is called a \_\_\_\_\_.
  - Multi frame a) Mainframe c)
- b) Mini frame d) All of the above

b) Fixed channel

d) Forward channel

- GSM stands for 6)
  - a) Global service for mobile
  - Group of special machines C)
- The scheme in which each cell is allocated a predetermined set of voice 7) channels is called as .
  - Dynamic channel a)
  - c) Demand channel
- 8) In Frequency Spectrum is divided into smaller spectra and is allocated to each user.
  - TDMA b) CDMA a) FDMA d) FGMA c)
- The antenna which attempts to direct all its energy in a particular direction 9) is called as a \_\_\_\_\_.
  - a) Directional Antenna

C)

Propagation Antenna

- b) One to one Antenna
- d) Single Direction Antenna

- b) Global scope for mobile
- d) Global system for mobile

- Marks: 14



10) Reflection is?

C)

c)

C)

- a) Propagation mode
- b) Propagation mechanism
- Spread spectrum
- d) None of the above
- 11) Spot Beam antenna is used in which of the following multiple access technique?
  - a) TDMA

- b) FDMA
- SDMA
- d) Both (a) and (b)
- 12) The model considered for both direct path and ground reflected propagation path between T-R is \_\_\_\_\_.
  - a) Hata model
- b) Two ray model
- d) Okumura model
- 13) Modulation technique used in CDMA 2000 is \_\_\_\_\_.
  - a) Uplink QPSK, Downlink BPSK
  - b) Uplink BPSK, Downlink QPSK
  - c) Uplink BPSK, Downlink BPSK
  - d) None of the above

Free space model

- 14) In GSM the downlink frequency band is \_
  - a) 890-915 MHz

- b) 935-960 MHz
- c) 890-935 MHz d) 917-945 MHz

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

### Section - I

### Q.2 Attempt any four of the following.

- a) Explain the process of Handoff in cellular system.
- b) Find the far field distance for an antenna with maximum dimension of 1meter and operating frequency of 900 MHz.
- c) Explain the concept of interference and system capacity.
- d) What is diffraction? Explain knife edge diffraction.
- e) Describe TDMA technique in detail and compare it with FDMA.

### Q.3 Attempt any two of the following.

- a) Explain in brief different methods used to improve capacity of cellular system.
- b) For given path loss exponent (i) n = 4 and (ii) n = 3 find the frequency reuse factor and the cluster size that should be used for maximum capacity. The signal-to-interference ratio of 15 dB is minimum required for satisfactory forward channel performance of a cellular system. There are 6 co-channel cells in the first tier and all of them are at the same distance from the mobile.
- c) Explain ground reflection model (two ray model). Also prove that the  $\mathbf{A} = (2 h_t h_r)/d$

(Where  $\blacktriangle$ - path difference between the Line of sight and ground reflected path)

#### Section - II

#### Q.4 Attempt any four of the following.

- a) Explain with neat block diagram forward channels in W-CDMA.
- b) Explain in detail forward IS 95-CDMA link structure.
- c) What is Handoff? Explain Handoff in GSM.
- d) Explain GSM frames in detail.
- e) Explain mobile call termination sequence in GSM.

#### Q.5 Attempt any two of the following.

- a) Explain 4G/LTE architecture.
- b) Draw and explain GSM signaling architecture in detail.
- c) Explain packet and frame format for forward and reverse CDMA IS-95 channels.

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Max. Marks: 56

16

12

12

## Set T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Thursday, 28-12-2019 Time: 10:00 AM To 12:00 PM

**Duration: 20 Minutes** 

sentence.

Q.1

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.

Choose the correct alternatives from the options and rewrite the

2) Answer MCQ Objective type questions on Page No. 3 only

MCQ/Objective Type Questions

3) Figures to right indicate full marks.

#### The addressing mode, where operand value is directly specified is called \_\_\_\_\_. 1) Immediate b) Direct a) Definite d) c) Relative Which representation is most efficient to perform arithmetic operations? 2) Sign magnitude b) 1's complements a) 2's complements d) None of these c) Which register points to the first instruction to be executed when the 3)

- processor starts.
  - a) Accumulator b) Program counter
  - c) Data register d) Instruction register
- 4) Speedup techniques of computer include \_
  - a) cache b) pipeline
  - all of these c) superscalar d)
- Floating point representation consist of \_ 5)
  - Mantissa b) exponent a) Both a) and b) d) none of these c)
- To read the control words sequentially 6) is used. IR PC b) a)
  - c) uPC d) None of these
- 7) Data used with assembly language instruction in processors are nothing but
  - a) Opcode b) Operand
  - None of these c) Register d)
- 8) In Processor DMA Stand for \_\_\_\_\_
  - a) Direct Memory Access b) **Division Memory Access**
  - **Direct mapping Access** All of the above c) d)

**COMPUTER ORGANIZATION** 



Max. Marks: 50

Seat No.

Marks: 10

#### 9) What is not true about RISC?

- a) Large no of addressing modes b)
- c) Hardwired control unit d)
- Simple instruction

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Set P

- A single chip processor
- To interface 2048 bytes of memory, how many address lines are 10) required?
  - a) 8 9 b) 10 d) 11 C)

Set

Max. Marks: 40

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

40

Ρ

Day & Time	& Date : 10:00	e: Th D AN	ursday, 28-12-2019 1 To 12:00 PM		Max. Marks: 50	)
Instr	uctior	1 <b>s:</b> 1 2) 3)	<ul> <li>) Q. No. 1 is compulsory and sho answer book.</li> <li>) Answer MCQ Objective type q</li> <li>) Figures to right indicate full ma</li> </ul>	ould b uestic arks.	e solved in first 20 minutes in ons on Page No. 3 only	
			MCQ/Objective Ty	/pe Q	Questions	
Durat	tion: 2	0 Mi	nutes		Marks: 10	)
Q.1	Choose the correct alternatives from the options and rewrite the sentence.			)		
	1)	To a) c)	read the control words sequentia PC uPC	lly b) d)	is used. IR None of these	
	2)	Dat but a) c)	a used with assembly language i  Opcode Register	nstruo b) d)	ction in processors are nothing Operand None of these	
	3)	In F a) c)	Processor DMA Stand for Direct Memory Access Direct mapping Access	b) d)	Division Memory Access All of the above	
	4)	Wh a) c)	at is not true about RISC? Large no of addressing modes Hardwired control unit	b) d)	Simple instruction A single chip processor	
	5)	To req a) c)	interface 2048 bytes of memory, uired? 8 10	how r b) d)	nany address lines are 9 11	
	6)	The a) c)	e addressing mode, where operal Immediate Definite	nd val b) d)	lue is directly specified is called Direct Relative	
	7)	Wh a) c)	ich representation is most efficier Sign magnitude 2's complements	nt to p b) d)	perform arithmetic operations? 1's complements None of these	
	8)	Wh pro a) c)	ich register points to the first inst cessor starts. Accumulator Data register	ructio b) d)	n to be executed when the Program counter Instruction register	
	9)	Spe a) c)	eedup techniques of computer ind cache superscalar	clude b) d)	 pipeline all of these	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** COMPUTER ORGANIZATION

D \_

Seat No.

## **SLR-FM-247**

Set Q



- Floating point representation consist of \_\_\_\_\_. a) Mantissa b) expo 10)

  - c) Both a) and b)

- b) exponentd) none of th none of these

Set

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40

40

Q

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No.	

a)

C)

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering COMPUTER ORGANIZATION** Max. Marks: 50

Day & Date: Thursday, 28-12-2019 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) Answer MCQ Objective type questions on Page No. 3 only

MCQ/Objective Type Questions

3) Figures to right indicate full marks.

#### **Duration: 20 Minutes** Marks: 10 Choose the correct alternatives from the options and rewrite the Q.1 sentence.

- What is not true about RISC? 1)
  - Large no of addressing modes b) Simple instruction
  - Hardwired control unit d) A single chip processor
- 2) To interface 2048 bytes of memory, how many address lines are required?
  - a) 8 9 b) 11 d) C) 10
- The addressing mode, where operand value is directly specified is called \_\_\_\_\_. 3)
  - a) Immediate Direct b)
  - c) Definite d) Relative
- 4) Which representation is most efficient to perform arithmetic operations?
  - 1's complements Sign magnitude b) a)
  - 2's complements None of these d) c)
- Which register points to the first instruction to be executed when the 5) processor starts.
  - a) Accumulator b) Program counter Instruction register c) Data register d)

6) Speedup techniques of computer include \_

- a) cache pipeline b)
- c) superscalar all of these d)
- 7) Floating point representation consist of
  - a) Mantissa exponent b) c) Both a) and b) d) none of these
- 8) To read the control words sequentially \_ is used.
  - a) PC IR b)
  - c) uPC d) None of these
- 9) Data used with assembly language instruction in processors are nothing but .
  - a) Opcode b) Operand Register None of these C) d)





- 10)In Processor DMA Stand for \_\_\_\_\_.a)Direct Memory Accessb)c)Direct mapping Accessd)
- Division Memory Access All of the above

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40

Set

40

R

## SLR-FM-247 Set

## Seat No.

4)

6)

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering COMPUTER ORGANIZATION**

Day & Date: Thursday, 28-12-2019 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) Answer MCQ Objective type questions on Page No. 3 only

MCQ/Objective Type Questions

3) Figures to right indicate full marks.

#### **Duration: 20 Minutes** Marks: 10 Q.1 Choose the correct alternatives from the options and rewrite the sentence.

- Which register points to the first instruction to be executed when the 1) processor starts.
  - a) Accumulator b) Program counter
  - Instruction register c) Data register d)

2)	Speedup tech	niques of	computer	include	
----	--------------	-----------	----------	---------	--

a) cache b) pipeline c) superscalar d) all of these

3) Floating point representation consist of

- a) Mantissa exponent b) c) Both a) and b) d) none of these
- To read the control words sequentially \_ is used.
- a) PC b) IR
  - c) uPC d) None of these
- Data used with assembly language instruction in processors are nothing 5) but
  - a) Opcode b) Operand c) Register d) None of these
  - In Processor DMA Stand for \_\_\_\_\_
    - a) Direct Memory Access **Division Memory Access** b)
    - c) Direct mapping Access All of the above d)

#### 7) What is not true about RISC?

- a) Large no of addressing modes b) Simple instruction A single chip processor
- c) Hardwired control unit d)
- 8) To interface 2048 bytes of memory, how many address lines are required?
  - a) 8 9 b)
  - d) 11 c) 10
- 9) The addressing mode, where operand value is directly specified is called \_\_\_\_\_.
  - Immediate Direct a) b) Definite d) Relative c)

Max. Marks: 50



- Which representation is most efficient to perform arithmetic operations?a) Sign magnitudeb)c) 2's complementsd)None of these 10)

Set

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40

40

S

### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPERATING SYSTEM**

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

Marks: 10

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Process is
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 2) The strategy of allowing processes that are logically runnable to be temporarily suspended is called .
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served
- 3) A non-relocatable program is one which \_\_\_\_\_.
  - a) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.
  - consists of a program and relevant information for its relocation. b)
  - can itself performs the relocation of its address-sensitive portions. c)
  - d) all of the above
- 4) Operating system
  - links a program with the subroutines it references a)
  - b) provides a layered, user-friendly interface
  - c) enables the programmer to draw a flowchart
  - d) all of the above
- Which of the following is not true about the memory management? 5)
  - a) virtual memory is used only in multi-user systems
  - b) segmentation suffers from external fragmentation
  - paging suffers from internal fragmentation c)
  - d) segmented memory can be paged
- Which of the following is characteristic of an operating system? 6)
  - a) resource management
  - c) memory management
- error recovery b)
- All the above d)
- A thread is a \_\_\_\_\_. 7)
  - a) Task
  - c) Program

Max. Marks: 50

- Process b)
- d) Light weight process

Set

Ρ

Set

**SLR-FM-248** 

- 8) In \_\_\_\_\_ the processes under consideration must be independent: that is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention
- b) deadlock avoidance
- c) deadlock detection
- d) deadlock deletion
- 9) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - a) memory partitioning
- b) virtual memory
- c) real memory d) memory organization
- 10) To access the services of operating system, the interface is provided by the \_\_\_\_\_.
  - a) System calls
  - c) library

b) APId) Assembly instructions

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## SLR-FM-248

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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Q.2 Attempt any four of the following questions.

- a) Why we need the operating system? Explain following types of operating system
  - 1) Time sharing system
  - 2) Real time system
- **b)** What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- **d)** What are necessary conditions for deadlock situation? Explain resource allocation graph with dead lock.
- e) Discuss in detail paging as memory management scheme.



Max. Marks: 40

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

**OPERATING SYSTEM** 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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Electronics & Telecommunication Engineering** 

**Duration: 20 Minutes** 

2)

Seat No.

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

b)

d)

b)

- 1) Which of the following is characteristic of an operating system? error recovery
  - a) resource management
  - c) memory management
  - A thread is a .
    - a) Task
    - c) Program
- the processes under consideration must be independent: that 3) In is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention c) deadlock detection
- b) deadlock avoidance d) deadlock deletion

Assembly instructions

- 4) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - memory partitioning a) b) virtual memory
  - c) real memory d) memory organization
- 5) To access the services of operating system, the interface is provided by the .

b)

d)

API

- a) System calls c) library
- 6) Process is \_\_\_\_\_
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 7) The strategy of allowing processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_.
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served

- Process
- d) Light weight process

All the above

**SLR-FM-248** 



Marks: 10

### 8) A non-relocatable program is one which \_\_\_\_\_.

a) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.

**SLR-FM-248** 

Set

- b) consists of a program and relevant information for its relocation.
- c) can itself performs the relocation of its address-sensitive portions.
- d) all of the above
- 9) Operating system \_\_\_\_
  - a) links a program with the subroutines it references
  - b) provides a layered, user-friendly interface
  - c) enables the programmer to draw a flowchart
  - d) all of the above
- 10) Which of the following is not true about the memory management?
  - a) virtual memory is used only in multi-user systems
  - b) segmentation suffers from external fragmentation
  - c) paging suffers from internal fragmentation
  - d) segmented memory can be paged

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### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### **Q.2** Attempt any four of the following questions.

- a) Why we need the operating system? Explain following types of operating system
  - 1) Time sharing system
  - 2) Real time system
- **b)** What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- **d)** What are necessary conditions for deadlock situation? Explain resource allocation graph with dead lock.
- e) Discuss in detail paging as memory management scheme.



Max. Marks: 40

Set

R

### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - a) memory partitioning
- b) virtual memory
- c) real memory
  d) memory organization
  2) To access the services of operating system, the interface is provided by
  - the \_\_\_\_\_.
  - a) System calls b) API
  - c) library
- d) Assembly instructions

- 3) Process is \_\_\_\_
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 4) The strategy of allowing processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_.
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served
- 5) A non-relocatable program is one which \_\_\_\_\_
  - a) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.
  - b) consists of a program and relevant information for its relocation.
  - c) can itself performs the relocation of its address-sensitive portions.
  - d) all of the above
- 6) Operating system \_\_\_\_
  - a) links a program with the subroutines it references
  - b) provides a layered, user-friendly interface
  - c) enables the programmer to draw a flowchart
  - d) all of the above

Max. Marks: 50

Marks: 10

#### 7) Which of the following is not true about the memory management?

- a) virtual memory is used only in multi-user systems
- b) segmentation suffers from external fragmentation
- c) paging suffers from internal fragmentation
- d) segmented memory can be paged

#### 8) Which of the following is characteristic of an operating system?

- a) resource management
- error recovery b)
- c) memory management
- d) All the above

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Set R

- 9) A thread is a \_\_\_\_\_.

a) Task

- b) Process
- c) Program d) Light weight process
- In \_\_\_\_\_ the processes under consideration must be independent: that 10) is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention
  - c) deadlock detection
- b) deadlock avoidance
  - deadlock deletion d)

Seat	
No.	

### T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPERATING SYSTEM**

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

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Q.2 Attempt any four of the following questions.

- Why we need the operating system? Explain following types of operating a) system
  - 1) Time sharing system
  - 2) Real time system
- What do you mean by process in operating system? List different process b) States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- What are necessary conditions for deadlock situation? Explain resource d) allocation graph with dead lock.
- Discuss in detail paging as memory management scheme. e)

Set

Max. Marks: 40



### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPERATING SYSTEM**

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### 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) A non-relocatable program is one which
  - cannot be made to execute in any area of storage other than the one a) designated for it at the time of its coding or translation.
  - consists of a program and relevant information for its relocation. b)
  - can itself performs the relocation of its address-sensitive portions. c)
  - d) all of the above

#### 2) Operating system

- a) links a program with the subroutines it references
- b) provides a layered, user-friendly interface
- c) enables the programmer to draw a flowchart
- d) all of the above
- 3) Which of the following is not true about the memory management?
  - a) virtual memory is used only in multi-user systems
  - b) segmentation suffers from external fragmentation
  - c) paging suffers from internal fragmentation
  - d) segmented memory can be paged
- 4) Which of the following is characteristic of an operating system?
  - resource management a)
  - memory management C)
- 5) A thread is a \_\_\_\_\_.

Program

Task a)

c)

b) Process

b)

d)

b)

Light weight process d)

deadlock avoidance

error recoverv

All the above

- In the processes under consideration must be independent: that 6) is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention
  - c) deadlock detection d) deadlock deletion
- 7) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - memory partitioning a)
  - real memory C)

- virtual memory b)
- d) memory organization



## Set

Max. Marks: 50



- 8) To access the services of operating system, the interface is provided by the \_\_\_\_\_.
  - a) System callsc) library

- b) API
- d) Assembly instructions

- 9) Process is \_\_\_\_\_.
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 10) The strategy of allowing processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_.
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served

40

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### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Q.2 Attempt any four of the following questions.

- a) Why we need the operating system? Explain following types of operating system
  - 1) Time sharing system
  - 2) Real time system
- **b)** What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- d) What are necessary conditions for deadlock situation? Explain resource allocation graph with dead lock.
- e) Discuss in detail paging as memory management scheme.



Max. Marks: 40

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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 the right indicate full marks.

### 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) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor Motion sensor b)
  - c) Action sensor d) Touch sensor
- 2) The common robotic arm has \_\_\_\_\_ degrees of freedom.
  - Five a) Six b) c) Four
    - d) Three

#### The process of extracting, characterizing and interpreting information from 3) images of 3 D world is referred as \_

- b) Robochar a) Robot vision
- Robo 3D c) d) Roboextract
- 4) Robotic vehicles are used in
  - a) Remotely operated communication systems
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above

#### Programming of a robot can be done by 5)

- a) Force sensors Teach pendant programming b)
- c) Tactile sensors d) **Touch sensors**
- 6) The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above
- 7) The following sensor can detect nearby objects \_\_\_\_\_
  - Touch sensor Humidity sensor b) a) C)
    - Proximity sensor d) Pressure sensor

#### 8) A robot is a \_\_\_\_

- multifunctional and reprogrammable manipulator a)
- unifunctional and reprogrammable manipulator b)
- multifunctional and non-programmable manipulator c)
- unifunctional and non-programmable manipulator d)

Max. Marks: 50

Set

#### \_\_\_\_\_ can be used to measure the distance from a reference to the 9) object in the field.

a) Force sensor

b) Pressure sensor

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Set P

- c) Range sensor d)
- Torque sensor
- The speed regulation is good in \_\_\_\_\_. a) Series wound motor 10)

  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above

Set

### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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 the right indicate full marks.

#### Q.2 Attempt any four of the following:

- Explain motion control of robots. a)
- b) Explain robotic applications.
- c) Explain the following terms related to robotics :
  - Accuracy 1)
  - Precision 2)
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- Explain Microelectromechanical systems and write in brief about e) classification of MEMS.
- What is machine Intelligence? Explain Computer and robotics Future **f**) trends.
- Explain electrical drives for robotic articulation. g)



Ρ

Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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 the right indicate full marks.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

Marks: 10

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10 1)

- The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above
- 2) The following sensor can detect nearby objects \_\_\_\_\_
  - Touch sensor b) Humidity sensor a)
    - Proximity sensor d) Pressure sensor C)
- 3) A robot is a
  - a) multifunctional and reprogrammable manipulator
  - b) unifunctional and reprogrammable manipulator
  - c) multifunctional and non-programmable manipulator
  - d) unifunctional and non-programmable manipulator
- 4) can be used to measure the distance from a reference to the object in the field.
  - a) Force sensor

c) Range sensor

- b) Pressure sensor d) Torque sensor
- The speed regulation is good in \_\_\_\_\_. 5)
  - a) Series wound motor
  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above
- 6) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor Motion sensor b)
  - c) Action sensor d) Touch sensor
- The common robotic arm has \_\_\_\_\_ degrees of freedom. 7)
  - a) Six b) Five
  - c) Four Three d)
- The process of extracting, characterizing and interpreting information from 8) images of 3 D world is referred as \_
  - a) Robot vision b) Robochar
  - c) Robo 3D d) Roboextract



Max. Marks: 50

- Robotic vehicles are used in \_\_\_\_\_. 9)
  - a) Remotely operated communication systems
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above
- Programming of a robot can be done by \_\_\_\_ 10) b)
  - a) Force sensors
- c) Tactile sensors

- \_\_\_\_\_. Teach pendant programming
- . Touch sensors d)

### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Max. Marks: 40

No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS Max. Marks: 50

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 the right indicate full marks.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

Marks: 10

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

b)

Pressure sensor

- \_\_\_\_\_ can be used to measure the distance from a reference to the 1) object in the field.
  - a) Force sensor
  - c) Range sensor d) Torque sensor
- 2) The speed regulation is good in \_\_\_\_\_.
  - a) Series wound motor
  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above
- 3) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor b) Motion sensor Touch sensor
  - c) Action sensor d)
- 4) The common robotic arm has \_\_\_\_\_ degrees of freedom.
  - a) Six b) Five
  - c) Four d) Three
- The process of extracting, characterizing and interpreting information from 5) images of 3 D world is referred as
  - Robochar a) Robot vision b)
  - c) Robo 3D d) Roboextract
- 6) Robotic vehicles are used in
  - a) Remotely operated communication systems
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above

#### Programming of a robot can be done by \_ 7)

- a) Force sensors Teach pendant programming b)
- c) Tactile sensors Touch sensors d)
- 8) The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above

Set R



- 9) The following sensor can detect nearby objects \_\_\_\_\_.
  - a) Touch sensor

- b) Humidity sensor
- c) Proximity sensor
- d) Pressure sensor

- 10) A robot is a \_\_\_\_\_.
  - a) multifunctional and reprogrammable manipulator
  - b) unifunctional and reprogrammable manipulator
  - c) multifunctional and non-programmable manipulator
  - d) unifunctional and non-programmable manipulator
### Seat No.

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Max. Marks: 40

40

Set R

# Set

### T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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 the right indicate full marks.

### 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

- The process of extracting, characterizing and interpreting information from 1) images of 3 D world is referred as b) Robochar
  - a) Robot vision
  - c) Robo 3D d)
- 2) Robotic vehicles are used in
  - Remotely operated communication systems a)
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above

#### Programming of a robot can be done by \_ 3)

- a) Force sensors b)
- c) Tactile sensors d) Touch sensors
- 4) The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - To increase productivity b)
  - c) To enhance the life of production machines
  - d) All of the above
- 5) The following sensor can detect nearby objects
  - a) Touch sensor b) Humidity sensor
  - c) Proximity sensor d) Pressure sensor
- 6) A robot is a
  - a) multifunctional and reprogrammable manipulator
  - b) unifunctional and reprogrammable manipulator
  - c) multifunctional and non-programmable manipulator
  - d) unifunctional and non-programmable manipulator
- can be used to measure the distance from a reference to the 7) object in the field.
  - a) Force sensor c) Range sensor
- b) Pressure sensor
- d) Torque sensor
- The speed regulation is good in . 8)
  - a) Series wound motor
  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above

Max. Marks: 50

Roboextract

Teach pendant programming

#### Which of the following is a sensor that measures the movement of an 9) object?

- a) Pressure sensor
- b) Motion sensor

**SLR-FM-249** 

Set S

- Touch sensor c) Action sensor d)
- The common robotic arm has \_\_\_\_\_ degrees of freedom. 10)
  - a) Six b) Five d)
  - c) Four

Three

Seat	
No.	

### T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Max. Marks: 40

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

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 maximum marks.
- 3) Assume the data whenever necessary.

### 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) In microwave, we take the elements as \_\_\_\_\_.
  - a) lumped circuit element
  - b) distributed circuit element
  - c) both a) and b)
  - d) None of above
- 2) The Wavelength of microwaves at 100 GHz will be\_\_\_\_\_.
  - a) 3cm b) 0.3cm c) 0.03cm d) 0.3m

  - The transferred electron bulk effect occurs in \_\_\_\_\_ a) germanium b) silicon
    - c) gallium arsenide d) boron
- 4) Waveguide may be considered as\_\_\_\_\_
  - a) high pass filter b) low pass filter
  - c) band pass filter d) band reject filter
- 5) In case of matched load\_\_\_\_\_
  - a) transmission is zero
  - b) reflection is zero
  - c) reflection is unity
  - d) transmission is equals to reflection
- 6) Tee's and junctions constitutes \_
  - a) single port network b) two port network
  - c) Three port network d) three or more port network
- 7) The propagation constant of a transmission line is given by.
  - a)  $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$ c)  $\sqrt{1/LC}$ b)  $\sqrt{(R+j\omega L)(g+J\omega c)}$ d) none of these
- 8) When the target is moving away from the CW Doppler radar, the received frequency \_\_\_\_\_.
  - a) is higher than the transmitted frequency
  - b) is lower than the transmitted frequency
  - c) has a lot of harmonic content
  - d) none of these

Set P

Max. Marks: 70

Page 2 of 16

### If the peak transmitted power in a radar system is increased by a factor of 81, the maximum range increases by a factor of \_\_\_\_\_

- a) 3 b) 6
- c) 9 d) 81
- 10) The CAHO in MTI radar operates at the \_\_\_\_\_.
  - transmitted frequency received frequency b) intermediate frequency a)
    - - d) none of these
- TWT uses a helix \_\_\_\_\_ 11)

C)

9)

- a) To reduce the axial velocity of RF field
- b) To ensure broad band operation
- To increase the efficiency C)
- d) To reduce the noise

#### The $\pi$ -mode of resonance in a traveling wave magnetron is characterizes 12) by \_\_\_\_

n=N a)

- b) n=N/4
- n=N/2 d) none of the above C)
- 13) Electron bunching in reflex klystron occurs in the \_\_\_\_\_
  - input cavity only a)
- b) vicinity of repeller electrode
- centre of drift space c)
- d) none of these
- A magnetron has average power of 100 watts and duty cycle 2%. Its peak 14) power output power is \_\_\_\_\_.
  - a) 50W
  - c) 5000W

- b) 100W
- d) 10,000W



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### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

#### **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate maximum marks.
- 3) Assume the data whenever necessary.

#### Section – I

### Q.2 Attempt any three

- a) Explain Transmission line equation in terms of voltage and current.
- b) Define following with the help waveguide
  - i) Cut off Condition
  - ii) Dominant mode
  - iii) Degenerative mode
  - iv) Evanescent mode
- c) Explain E plane tee as 3 dB coupler.
- d) Explain Magic tee as Impedance Bridge.
- e) Derive the following for TE<sub>mn</sub> mode in rectangular waveguide
  - i) Cut off wave number
  - ii) Guided wavelength
  - iii) Phase velocity in guide
  - iv) Characteristics Impedance of guide

### Q.3 Attempt any two

- An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE<sub>11</sub> mode at 10GHz. Find
  - i) Cut off wave frequency
  - ii) Propagation constant
  - iii) Guided wavelength
  - iv) Phase velocity in waveguide
- **b)** A transmission line 10 miles long operates at 10 KHz and has parameters  $R=30\Omega/miles$ , C= 80nF/miles, L=2.2mH/miles, and G=20nS/miles. Find characteristics impedance, attenuation per miles, phase shift per miles, phase velocity and wavelength.
- c) Derive the field equation of TM<sub>mn</sub> mode in rectangular waveguide assuming wave is propagating in z-direction.

#### Section – II

### Q.4 Attempt any three

- a) Explain wave meter method for frequency measurement.
- b) Explain radar display methods.
- c) Calculate minimum receivable signal in radar receiver, which has I.F. band of 1.75 MHz and 7.5dB noise figure.
- d) For Two cavity klystron, voltage gain is 15dB, input power 5mW,  $R_{sh}$  of input cavity is  $30K\Omega$ ,  $R_{sh}$  of output cavity is  $40 \ K\Omega$ . Determine- input RMS voltage, output RMS voltage.
- e) Explain Zero mode of Magnetron.

Max. Marks: 56

16

12



Seat No.



16

### Q.5 Attempt any two

- a)
- Explain effect of noise on Radar Range. Derive and explain Velocity modulation in two cavity klystron tube with b) Applegate diagram.
- c) Explain Doppler Effect. Also draw and explain MTI radar.

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING**

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 maximum marks.
- 3) Assume the data 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

- When the target is moving away from the CW Doppler radar, the received 1) frequency
  - is higher than the transmitted frequency a)
  - b) is lower than the transmitted frequency
  - has a lot of harmonic content c)
  - d) none of these

#### 2) If the peak transmitted power in a radar system is increased by a factor of 81, the maximum range increases by a factor of

- a) 3 b) 6
- C) 9 d) 81
- 3) The CAHO in MTI radar operates at the
  - transmitted frequency a)
- b) intermediate frequency
- received frequency c)
- d) none of these

#### TWT uses a helix \_\_\_\_\_. 4)

- a) To reduce the axial velocity of RF field
- To ensure broad band operation b)
- To increase the efficiency C)
- To reduce the noise d)

#### The $\pi$ -mode of resonance in a traveling wave magnetron is characterizes 5)

by \_

a)

- n=N b) n=N/4
- n=N/2 d) none of the above c)
- Electron bunching in reflex klystron occurs in the \_ 6)
  - a) input cavity only b) vicinity of repeller electrode

d) none of these

- centre of drift space c)
- A magnetron has average power of 100 watts and duty cycle 2%. Its peak 7) power output power is \_\_\_\_\_. 50W a)
  - 100W b)
  - 5000W 10,000W c) d)

Set

Max. Marks: 70

Set 8) In microwave, we take the elements as \_\_\_\_\_. lumped circuit element a) b) distributed circuit element both a) and b) c) None of above d) 9) The Wavelength of microwaves at 100 GHz will be\_\_\_\_\_ a) 3cm b) 0.3cm c) 0.03cm d) 0.3m The transferred electron bulk effect occurs in \_\_\_\_ 10) a) germanium b) silicon c) gallium arsenide d) boron 11) Waveguide may be considered as\_ high pass filter b) low pass filter a) band pass filter d) band reject filter c) 12) In case of matched load transmission is zero a) reflection is zero b) reflection is unity c) transmission is equals to reflection d) 13) Tee's and junctions constitutes single port network b) two port network a) Three port network d) three or more port network C) 14)

- 14) The propagation constant of a transmission line is given by. a)  $\sqrt{\frac{R+j\omega L}{(R+j\omega L)(g+J\omega c)}}$  b)  $\sqrt{(R+j\omega L)(g+J\omega c)}$ 
  - a)  $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$

 $\sqrt{1/LC}$ 

C)

d) none of these

Page **6** of **16** 

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### Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

### **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate maximum marks.
- 3) Assume the data whenever necessary.

#### Section – I

### Q.2 Attempt any three

- a) Explain Transmission line equation in terms of voltage and current.
- b) Define following with the help waveguide
  - i) Cut off Condition
  - ii) Dominant mode
  - iii) Degenerative mode
  - iv) Evanescent mode
- c) Explain E plane tee as 3 dB coupler.
- d) Explain Magic tee as Impedance Bridge.
- e) Derive the following for TE<sub>mn</sub> mode in rectangular waveguide
  - i) Cut off wave number
  - ii) Guided wavelength
  - iii) Phase velocity in guide
  - iv) Characteristics Impedance of guide

### Q.3 Attempt any two

- a) An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE<sub>11</sub> mode at 10GHz. Find
  - i) Cut off wave frequency
  - ii) Propagation constant
  - iii) Guided wavelength
  - iv) Phase velocity in waveguide
- **b)** A transmission line 10 miles long operates at 10 KHz and has parameters  $R=30\Omega/miles$ , C= 80nF/miles, L=2.2mH/miles, and G=20nS/miles. Find characteristics impedance, attenuation per miles, phase shift per miles, phase velocity and wavelength.
- c) Derive the field equation of TM<sub>mn</sub> mode in rectangular waveguide assuming wave is propagating in z-direction.

#### Section – II

### Q.4 Attempt any three

- a) Explain wave meter method for frequency measurement.
- b) Explain radar display methods.
- c) Calculate minimum receivable signal in radar receiver, which has I.F. band of 1.75 MHz and 7.5dB noise figure.
- d) For Two cavity klystron, voltage gain is 15dB, input power 5mW,  $R_{sh}$  of input cavity is  $30K\Omega$ ,  $R_{sh}$  of output cavity is  $40 \ K\Omega$ . Determine- input RMS voltage, output RMS voltage.
- e) Explain Zero mode of Magnetron.

# Max. Marks: 56

Set

16

12



16

### Q.5 Attempt any two

- a)
- Explain effect of noise on Radar Range. Derive and explain Velocity modulation in two cavity klystron tube with b) Applegate diagram.
- c) Explain Doppler Effect. Also draw and explain MTI radar.

Set

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING**

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 maximum marks.
- 3) Assume the data whenever necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Seat

No.

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

- In case of matched load 1)
  - a) transmission is zero
  - b) reflection is zero
  - reflection is unity c)
  - d) transmission is equals to reflection
- Tee's and junctions constitutes \_\_\_\_ 2)
  - a) single port network b) two port network
  - Three port network d) three or more port network c)
- 3) The propagation constant of a transmission line is given by.
  - a)  $\sqrt{(R+j\omega L)(g+j\omega c)}$  $R+j\omega L$ b) G+jwC d) none of these C)  $\sqrt{1/LC}$
- When the target is moving away from the CW Doppler radar, the received 4) frequency\_
  - is higher than the transmitted frequency a)
  - is lower than the transmitted frequency b)
  - c) has a lot of harmonic content
  - none of these d)

#### If the peak transmitted power in a radar system is increased by a factor of 5) 81, the maximum range increases by a factor of

- 3 a) b) 6 9 d) 81
- C)
- 6) The CAHO in MTI radar operates at the \_\_\_\_\_
  - transmitted frequency b) intermediate frequency c) intermediate frequency d) none of these a) c)
    - received frequency
- TWT uses a helix \_\_\_\_\_. 7)
  - a) To reduce the axial velocity of RF field
  - b) To ensure broad band operation
  - To increase the efficiency C)
  - To reduce the noise d)

Max. Marks: 70

Marks: 14

8) The  $\pi$ -mode of resonance in a traveling wave magnetron is characterizes by \_\_\_\_\_ . a) n=N b) n=N/4 d) none of the above c) n=N/2 9) Electron bunching in reflex klystron occurs in the input cavity only b) vicinity of repeller electrode a) centre of drift space d) none of these C) A magnetron has average power of 100 watts and duty cycle 2%. Its peak 10) power output power is \_\_\_\_\_. 50W b) 100W a) c) 5000W d) 10,000W 11) In microwave, we take the elements as \_\_\_\_\_. lumped circuit element a) distributed circuit element b) c) both a) and b) d) None of above 12) The Wavelength of microwaves at 100 GHz will be\_\_\_\_\_. 3cm b) 0.3cm a) 0.03cm d) 0.3m C) The transferred electron bulk effect occurs in \_\_\_\_\_ 13) a) germanium b) silicon gallium arsenide C) d) boron Waveguide may be considered as\_ 14) high pass filter b) low pass filter

a) high pass filterb) low pass filterb) band pass filterb) band reject filter

**SLR-FM-250** 

Set |

### Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

### **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate maximum marks.
- 3) Assume the data whenever necessary.

#### Section – I

### Q.2 Attempt any three

- a) Explain Transmission line equation in terms of voltage and current.
- b) Define following with the help waveguide
  - i) Cut off Condition
  - ii) Dominant mode
  - iii) Degenerative mode
  - iv) Evanescent mode
- c) Explain E plane tee as 3 dB coupler.
- d) Explain Magic tee as Impedance Bridge.
- e) Derive the following for TE<sub>mn</sub> mode in rectangular waveguide
  - i) Cut off wave number
  - ii) Guided wavelength
  - iii) Phase velocity in guide
  - iv) Characteristics Impedance of guide

### Q.3 Attempt any two

- a) An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE<sub>11</sub> mode at 10GHz. Find
  - i) Cut off wave frequency
  - ii) Propagation constant
  - iii) Guided wavelength
  - iv) Phase velocity in waveguide
- **b)** A transmission line 10 miles long operates at 10 KHz and has parameters  $R=30\Omega/miles$ , C= 80nF/miles, L=2.2mH/miles, and G=20nS/miles. Find characteristics impedance, attenuation per miles, phase shift per miles, phase velocity and wavelength.
- c) Derive the field equation of TM<sub>mn</sub> mode in rectangular waveguide assuming wave is propagating in z-direction.

#### Section – II

### Q.4 Attempt any three

- a) Explain wave meter method for frequency measurement.
- b) Explain radar display methods.
- c) Calculate minimum receivable signal in radar receiver, which has I.F. band of 1.75 MHz and 7.5dB noise figure.
- d) For Two cavity klystron, voltage gain is 15dB, input power 5mW,  $R_{sh}$  of input cavity is  $30K\Omega$ ,  $R_{sh}$  of output cavity is  $40 \ K\Omega$ . Determine- input RMS voltage, output RMS voltage.
- e) Explain Zero mode of Magnetron.

# Max. Marks: 56

Set

16

12



16

### Q.5 Attempt any two

- a)
- Explain effect of noise on Radar Range. Derive and explain Velocity modulation in two cavity klystron tube with b) Applegate diagram.
- c) Explain Doppler Effect. Also draw and explain MTI radar.

Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING**

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 maximum marks.
- 3) Assume the data whenever necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

- The CAHO in MTI radar operates at the 1)
  - a) transmitted frequencyb) intermediate frequencyc) received frequencyd) none of these
- TWT uses a helix \_\_\_\_\_. 2)
  - a) To reduce the axial velocity of RF field
  - b) To ensure broad band operation
  - c) To increase the efficiency
  - d) To reduce the noise

#### 3) The $\pi$ -mode of resonance in a traveling wave magnetron is characterizes

by \_ n=N a)

c)

c)

n=N/2

- b) n=N/4
  - d) none of the above
- 4) Electron bunching in reflex klystron occurs in the
  - input cavity only a) centre of drift space
- b) vicinity of repeller electrode d) none of these
- A magnetron has average power of 100 watts and duty cycle 2%. Its peak 5) power output power is \_\_\_\_\_.
  - a) 50W b) 100W
  - d) 10.000W c) 5000W
- 6) In microwave, we take the elements as \_\_\_\_\_.
  - lumped circuit element a)
  - b) distributed circuit element
  - both a) and b) c)
  - None of above d)
- The Wavelength of microwaves at 100 GHz will be . 7)
  - 3cm b) 0.3cm a)
  - c) 0.03cm d) 0.3m
- The transferred electron bulk effect occurs in 8) b) silicon
  - a) germanium c)
    - gallium arsenide d) boron

Max. Marks: 70

Set

Marks: 14

- 9) Waveguide may be considered as\_\_\_\_
  - a) high pass filter

- b) low pass filter
- c) band pass filter
- d) band reject filter

Set

- 10) In case of matched load\_\_\_\_\_.
  - a) transmission is zero
  - b) reflection is zero
  - c) reflection is unity
  - d) transmission is equals to reflection
- 11) Tee's and junctions constitutes \_\_\_\_
  - a) single port network b) two port network
  - c) Three port network d) three or more port network
- 12) The propagation constant of a transmission line is given by.
  - a)  $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$ c)  $\sqrt{1/LC}$ b)  $\sqrt{(R+j\omega L)(g+J\omega c)}$ d) none of these
- 13) When the target is moving away from the CW Doppler radar, the received frequency \_\_\_\_\_.
  - a) is higher than the transmitted frequency
  - b) is lower than the transmitted frequency
  - c) has a lot of harmonic content
  - d) none of these

# 14) If the peak transmitted power in a radar system is increased by a factor of 81, the maximum range increases by a factor of \_\_\_\_\_

- a) 3 b) 6
- c) 9 d) 81

Max. Marks: 56

Set

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate maximum marks.
- 3) Assume the data whenever necessary.

### Section – I

### Q.2 Attempt any three

Seat

No.

- a) Explain Transmission line equation in terms of voltage and current.
- b) Define following with the help waveguide
  - i) Cut off Condition
  - ii) Dominant mode
  - iii) Degenerative mode
  - iv) Evanescent mode
- c) Explain E plane tee as 3 dB coupler.
- d) Explain Magic tee as Impedance Bridge.
- e) Derive the following for TE<sub>mn</sub> mode in rectangular waveguide
  - i) Cut off wave number
  - ii) Guided wavelength
  - iii) Phase velocity in guide
  - iv) Characteristics Impedance of guide

### Q.3 Attempt any two

- An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE<sub>11</sub> mode at 10GHz. Find
  - i) Cut off wave frequency
  - ii) Propagation constant
  - iii) Guided wavelength
  - iv) Phase velocity in waveguide
- b) A transmission line 10 miles long operates at 10 KHz and has parameters R=30Ω/miles, C= 80nF/miles, L=2.2mH/miles, and G=20nS/miles. Find characteristics impedance, attenuation per miles, phase shift per miles, phase velocity and wavelength.
- c) Derive the field equation of TM<sub>mn</sub> mode in rectangular waveguide assuming wave is propagating in z-direction.

#### Section – II

### Q.4 Attempt any three

- a) Explain wave meter method for frequency measurement.
- **b)** Explain radar display methods.
- c) Calculate minimum receivable signal in radar receiver, which has I.F. band of 1.75 MHz and 7.5dB noise figure.
- d) For Two cavity klystron, voltage gain is 15dB, input power 5mW,  $R_{sh}$  of input cavity is 30K $\Omega$ ,  $R_{sh}$  of output cavity is 40 K $\Omega$ . Determine- input RMS voltage, output RMS voltage.



12

16

e) Explain Zero mode of Magnetron.

## SLR-FM-250

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16

#### Q.5 Attempt any two

- a) Explain effect of noise on Radar Range.
- b) Derive and explain Velocity modulation in two cavity klystron tube with Applegate diagram.
- c) Explain Doppler Effect. Also draw and explain MTI radar.

Seat No.					Set	Ρ
	T.E. (Part Electr MICF	– II) (Old) (CGPA) onics & Telecomr ROCONTROLLERS	Exami nunica S AND	ination Nov/Dec-201 ation Engineering APPLICATIONS	9	
Day & Time: 7	Date: Saturday, 2 10:00 AM To 01:0	23-11-2019 00 PM		Ма	ax. Marks	s: 70
Instruc	ctions: 1) Q. No. answe 2) Use of 3) Assum	1 is compulsory and it er book. non programmable Ca le Suitable Data if nece	t should alculato essary.	be solved in first 30 minu r is allowed.	utes in	
		MCQ/Objective	Type Q	Questions		
Duratic	on: 30 Minutes	•			Mark	s: 14
Q.1 (	Choose the corresentence.	ect alternatives from	the opt	ions and rewrite the		14
1	I) SJMP instru	iction is byte ins	structior	).		
	a) 1 c) 3		b) d)	2 None		
2	<ol> <li>In the 8051, bytes of, cod a) 8 c) 32</li> </ol>	control can be transfe de space if using the L	erred an CALL ir b) d)	ywhere within the nstruction. 16 64	К	
3	3) In 8051, SP a) 8 c) 32	register is bit w	vide. b) d)	16 None		
4	4) What is the a) 83H c) 81H	address of DPL	 b) d)	82H 88H		
5	5) In microcon microcontro a) DB0 c) EN	troller & LCD interface ller sending a data or o	, which commar b) d)	line will instruct the LCD nd? RW RS	that	
6	6) What are th a) 99h,88h c) a8h,b8h	e address of SFR's IE n,90h,81h n,d 0h,8ch	, IP, PS' b) d)	W & TH 0 respectively? 87h,d 0h,8bh,8ch 98h,89h,d 0h,8ah		
7	7) Out of follov a) PSW c) SBUF	ving registers, which re	egister is b) d)	s not bit addressable regi TCON IE	ster?	
8	<ol> <li>Which of the a) INTCON c) PCL</li> </ol>	e following FSR is use N	d for ind b) d)	lirect addressing mode of INDF STATUS	PIC?	
g	9) The PIC act a) 12 bit c) 14 bit	ually uses a pro	ogram c b) d)	ounter. 13 bit 15 bit		

- Set P
- 10) Special Purpose Registers of PIC 16F877 are mapped into data space at \_\_\_\_\_.
  - a) 00H-1FH

b) 80H - 9FH

none of these

- c) both a & b d)
- 11) The Vref for ADC in PIC is selected by \_\_\_\_\_ register.
  - a) ADCONO b) ADCON1
  - c) ADRES d) PIR1
- 12) The timer used for capture, compare and PWM mode respectively are \_\_\_\_\_.
  - a) Timer 0, Timer 1, Timer 2 b) Timer 2, Timer 1, Timer 0
  - c) Timer 1, Timer 1, Timer 2 d) Timer 2, Timer 1, Timer 1
- 13) PIR1 register contains \_\_\_\_\_ and PIE1 contains \_\_\_\_\_ bits.
  - a) Interrupt Priority, Interrupt Enable
  - b) Interrupt Flag, Interrupt Priority
  - c) Interrupt Priority, Interrupt Flag
  - d) Interrupt Flag, Interrupt Enable
- 14) PSA (Prescaler assignment) bit in the option register equals to 1 then \_\_\_\_\_.
  - a) Prescaler enabled
  - b) Prescaler disabled
  - c) Prescaler assigned to WDT
  - d) Prescaler assigned to TIMER0

Set

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any three.

- a) Explain following instructions.
  - 1) MOVC A, @A+PC
  - 2) DIV AB
  - 3) JNB 00h, relative address.
  - 4) XCHD.
- **b)** Assuming Crystal frequency is of 12MHz, Write a assembly language program to generate square wave of 100Hz frequency on pin P1.3 using timer.
- c) State from which memory (External program /Internal program /Internal Data/External Data) Data will be transfer for following Underlined instructions. (Consider EA bar = 1 or +5v & A=00h)
  - 1) MOV DPTR,#0EFFFh MOVC A,@A+DPTR
  - 2) MOV DPTR,#0030h
     MOVC A,@ A+DPTR
  - 3) MOV DPTR,#3FFFH MOVX A,@DPTR
  - 4) MOV R1,8
- d) Explain the SFRs associated with the interrupt structure of 8051.

### Q.3 Solve any two.

- a) Explain timer module with GATE input bit and INTx pin. Also explain in detail all modes of timer of Microcontroller 8051.
- **b)** Draw interfacing Diagram and Write a program to display data "SUS Solapur" on 16x2 LCD Display.
- c) Draw Interfacing of 4\*4 matrix keyboard & 7 segment display to 8051 and Write ALP to display on Seven segment display no. (From 0-f) pressed on 4\*4 Matrix keyboard.

### Section – II

### Q.4 Solve any three.

- a) Explain the following instructions.
  - 1) Clrwdt
  - 2) Incfsz
- **b)** Give the steps to be followed for doing A/D conversion in PIC16F877.
- c) Explain the memory organization of PIC 16F877.
- d) Explain and give necessity of Brown out reset and Watch Dog Timer in embedded system.

Max. Marks: 56

12

16

# Set P

16

### Q.5 Solve any two.

- a) Explain CCP1 module, how it is used for compare function along with Timer1?
- **b)** Explain different addressing modes of PIC. Write assembly language program for addition of two 16 bit numbers.
- c) Explain in detail  $I^2C$  bus for PIC16F877.

rupt Flag, Interrupt Enable		
escaler assignment) bit in th caler enabled caler disabled caler assigned to WDT caler assigned to TIMER0	e opti	ion register equals to 1 then
struction is byte instruction	uctior b) d)	n. 2 none

Timer 2, Timer 1, Timer 1

MICROCONTROLLERS AND APPLICATIONS Day & Date: Saturday, 23-11-2019 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) Use of non programmable Calculator is allowed. 3) Assume Suitable Data if necessary.

MCQ/Objective Type Questions

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** 

**Duration: 30 Minutes** 

6)

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- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
  - Which of the following FSR is used for indirect addressing mode of PIC? 1)
    - a) INTCON b) INDF c) PCL d) STATUS
  - 2) The PIC actually uses a \_\_\_\_\_ program counter.
    - 12 bit b) 13 bit a) 14 bit d) 15 bit c)

3) Special Purpose Registers of PIC 16F877 are mapped into data space at .

- a) 00H-1FH 80H - 9FH b)
- c) both a & b none of these d)
- The Vref for ADC in PIC is selected by \_\_\_\_\_ register. 4)
  - a) ADCONO ADCON1 b)
  - PIR1 c) ADRES d)
- The timer used for capture, compare and PWM mode respectively are \_\_\_\_\_. 5) b) Timer 2. Timer 1. Timer 0

d)

- Timer 0. Timer 1. Timer 2 a)
- c) Timer 1, Timer 1, Timer 2
- PIR1 register contains \_\_\_\_\_ and PIE1 contains \_\_\_\_\_ bits.
  - Interrupt Priority, Interrupt Enable a)
  - Interrupt Flag, Interrupt Priority b)
  - Interrupt Priority, Interrupt Flag c)
  - d) Interi

#### PSA (Pre 7)

- a) Pres
- b) Pres
- c) Pres
- d) Pres
- SJMP ins 8)
  - 1 a) c) 3

# **SLR-FM-251**



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Q

Max. Marks: 70

Marks: 14

			Set	Q
9)	In the 8051, control can be transferr bytes of, code space if using the LC a) 8 c) 32	ed an ALL ii b) d)	ywhere within the K nstruction. 16 64	
10)	In 8051, SP register is bit wid a) 8 c) 32	de. b) d)	16 None	
11)	What is the address of DPL a) 83H c) 81H	b) d)	82H 88H	
12)	In microcontroller & LCD interface, w microcontroller sending a data or co a) DB0 c) EN	which mma b) d)	line will instruct the LCD that nd? RW RS	
13)	What are the address of SFR's IE, I a) 99h,88h,90h,81h c) a8h,b8h,d 0h,8ch	P, PS b) d)	W & TH 0 respectively? 87h,d 0h,8bh,8ch 98h,89h,d 0h,8ah	
14)	Out of following registers, which reg a) PSW c) SBUF	ister i b) d)	s not bit addressable register? TCON IE	

**SLR-FM-251** 

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### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any three.

- a) Explain following instructions.
  - 1) MOVC A, @A+PC
  - 2) DIV AB
  - 3) JNB 00h, relative address.
  - 4) XCHD.
- **b)** Assuming Crystal frequency is of 12MHz, Write a assembly language program to generate square wave of 100Hz frequency on pin P1.3 using timer.
- c) State from which memory (External program /Internal program /Internal Data/External Data) Data will be transfer for following Underlined instructions. (Consider EA bar = 1 or +5v & A=00h)
  - 1) MOV DPTR,#0EFFFh MOVC A,@A+DPTR
  - 2) MOV DPTR,#0030h
     MOVC A,@ A+DPTR
  - 3) MOV DPTR,#3FFFH MOVX A,@DPTR
  - 4) MOV R1,8
- d) Explain the SFRs associated with the interrupt structure of 8051.

### Q.3 Solve any two.

- a) Explain timer module with GATE input bit and INTx pin. Also explain in detail all modes of timer of Microcontroller 8051.
- **b)** Draw interfacing Diagram and Write a program to display data "SUS Solapur" on 16x2 LCD Display.
- c) Draw Interfacing of 4\*4 matrix keyboard & 7 segment display to 8051 and Write ALP to display on Seven segment display no. (From 0-f) pressed on 4\*4 Matrix keyboard.

### Section – II

### Q.4 Solve any three.

- a) Explain the following instructions.
  - 1) Clrwdt
  - 2) Incfsz
- **b)** Give the steps to be followed for doing A/D conversion in PIC16F877.
- c) Explain the memory organization of PIC 16F877.
- d) Explain and give necessity of Brown out reset and Watch Dog Timer in embedded system.

Max. Marks: 56

16

12

### Set **Q** 16

### Q.5 Solve any two.

- a) Explain CCP1 module, how it is used for compare function along with Timer1?
- **b)** Explain different addressing modes of PIC. Write assembly language program for addition of two 16 bit numbers.
- c) Explain in detail  $I^2C$  bus for PIC16F877.

Day a Time	& Date : 10:00	e: Sa D AM	iturday, 23-11-2019 1 To 01:00 PM			Max. Marks: 70
Instr	uctior	n <b>s:</b> 1 2 3	) Q. No. 1 is compulsory and it s answer book. 2) Use of non programmable Calo 3) Assume Suitable Data if neces	hould culato sary.	be solved in first 30 m r is allowed.	inutes in
			MCQ/Objective Ty	ype Q	Questions	
Dura	tion: 3	0 Mi	nutes	-		Marks: 14
Q.1	Choo sente	ose t ence	the correct alternatives from th	ne opt	ions and rewrite the	14
	1)	In n mic a) c)	nicrocontroller & LCD interface, v crocontroller sending a data or co DB0 EN	vhich mmar b) d)	line will instruct the LC nd? RW RS	D that
	2)	Wh a) c)	at are the address of SFR's IE, I 99h,88h,90h,81h a8h,b8h,d 0h,8ch	P, PS' b) d)	W & TH 0 respectively 87h,d 0h,8bh,8ch 98h,89h,d 0h,8ah	?
	3)	Out a) c)	t of following registers, which reg PSW SBUF	ister is b) d)	s not bit addressable r TCON IE	egister?
	4)	Wh a) c)	ich of the following FSR is used f INTCON PCL	for inc b) d)	lirect addressing mode INDF STATUS	∍ of PIC?
	5)	The a) c)	e PIC actually uses a prog 12 bit 14 bit	ram c b) d)	ounter. 13 bit 15 bit	
	6)	Spe a) c)	ecial Purpose Registers of PIC 16 00H-1FH both a & b	6F877 b) d)	are mapped into data 80H - 9FH	a space at

c) both a & b none of these a)

7) The Vref for ADC in PIC is selected by \_\_\_\_\_ register.

- ADCON1 a) ADCONO b) c) ADRES PIR1 d)
- The timer used for capture, compare and PWM mode respectively are \_\_\_\_\_. 8)
  - a) Timer 0, Timer 1, Timer 2 b) Timer 2, Timer 1, Timer 0 c) Timer 1, Timer 1, Timer 2 Timer 2, Timer 1, Timer 1 d)
- 9) PIR1 register contains \_\_\_\_\_ and PIE1 contains \_\_\_\_\_ bits.
  - a) Interrupt Priority, Interrupt Enable
  - b) Interrupt Flag, Interrupt Priority
  - c) Interrupt Priority, Interrupt Flag
  - d) Interrupt Flag, Interrupt Enable

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** MICROCONTROL I FRS AND APPLICATIONS

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### **SLR-FM-251**

Set

R

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- 10) PSA (Prescaler assignment) bit in the option register equals to 1 then \_\_\_\_\_.
  - a) Prescaler enabled
  - b) Prescaler disabled
  - c) Prescaler assigned to WDT
  - d) Prescaler assigned to TIMER0
- 11) SJMP instruction is \_\_\_\_\_ byte instruction.
  - a) 1 b) 2
  - c) 3 d) none

12) In the 8051, control can be transferred anywhere within the \_\_\_\_\_ K bytes of, code space if using the LCALL instruction.

- a) 8 b) 16
- c) 32 d) 64
- 13) In 8051, SP register is \_\_\_\_\_ bit wide.
  - a) 8 b) 16
  - c) 32 d) none
- 14) What is the address of DPL \_\_\_\_\_.
  - a) 83H b) 82H c) 81H d) 88H

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### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any three.

- a) Explain following instructions.
  - 1) MOVC A, @A+PC
  - 2) DIV AB
  - 3) JNB 00h, relative address.
  - 4) XCHD.
- **b)** Assuming Crystal frequency is of 12MHz, Write a assembly language program to generate square wave of 100Hz frequency on pin P1.3 using timer.
- c) State from which memory (External program /Internal program /Internal Data/External Data) Data will be transfer for following Underlined instructions. (Consider EA bar = 1 or +5v & A=00h)
  - 1) MOV DPTR,#0EFFFh MOVC A,@A+DPTR
  - 2) MOV DPTR,#0030h
     MOVC A,@ A+DPTR
  - 3) MOV DPTR,#3FFFH MOVX A,@DPTR
  - 4) MOV R1,8
- d) Explain the SFRs associated with the interrupt structure of 8051.

### Q.3 Solve any two.

- a) Explain timer module with GATE input bit and INTx pin. Also explain in detail all modes of timer of Microcontroller 8051.
- **b)** Draw interfacing Diagram and Write a program to display data "SUS Solapur" on 16x2 LCD Display.
- c) Draw Interfacing of 4\*4 matrix keyboard & 7 segment display to 8051 and Write ALP to display on Seven segment display no. (From 0-f) pressed on 4\*4 Matrix keyboard.

### Section – II

### Q.4 Solve any three.

- a) Explain the following instructions.
  - 1) Clrwdt
  - 2) Incfsz
- **b)** Give the steps to be followed for doing A/D conversion in PIC16F877.
- c) Explain the memory organization of PIC 16F877.
- d) Explain and give necessity of Brown out reset and Watch Dog Timer in embedded system.

Max. Marks: 56

16

Set

R

12

# Set R

### Q.5 Solve any two.

- a) Explain CCP1 module, how it is used for compare function along with Timer1?
- **b)** Explain different addressing modes of PIC. Write assembly language program for addition of two 16 bit numbers.
- c) Explain in detail  $I^2C$  bus for PIC16F877.

MICROCONTROLLERS AND APPLICATIONS	S
Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM	Max. Marks:
<ul> <li>Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 answer book.</li> <li>2) Use of non programmable Calculator is allowed.</li> <li>3) Assume Suitable Data if necessary.</li> </ul>	) minutes in
MCQ/Objective Type Questions	
Duration: 30 Minutes	Marks:
<ul> <li>Q.1 Choose the correct alternatives from the options and rewrite to sentence.</li> <li>(1) Special Durness Degisters of DIC 105977 are meaned into d</li> </ul>	he
1) Special Purpose Registers of PIC 16F8/7 are mapped into d	ala space at

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** 

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No.

- Q.1
  - - a) 00H-1FH 80H - 9FH b) c) both a & b d) none of these
  - 2) The Vref for ADC in PIC is selected by \_\_\_\_\_ \_ register.
    - ADCON1 a) ADCONO b)
      - c) ADRES d) PIR1
  - The timer used for capture, compare and PWM mode respectively are \_\_\_\_\_. 3)
    - a) Timer 0, Timer 1, Timer 2 b) Timer 2, Timer 1, Timer 0
    - c) Timer 1, Timer 1, Timer 2 Timer 2. Timer 1. Timer 1 d)
  - PIR1 register contains and PIE1 contains bits. 4)
    - a) Interrupt Priority, Interrupt Enable
    - b) Interrupt Flag, Interrupt Priority
    - c) Interrupt Priority, Interrupt Flag
    - d) Interrupt Flag, Interrupt Enable

#### 5) PSA (Prescaler assignment) bit in the option register equals to 1 then \_\_\_\_\_.

- a) Prescaler enabled
- b) Prescaler disabled
- c) Prescaler assigned to WDT
- d) Prescaler assigned to TIMER0
- SJMP instruction is \_\_\_\_\_ byte instruction. 6)
  - a) 1 b) 2 c) 3 d) none
- In the 8051, control can be transferred anywhere within the \_\_\_\_\_ K 7) bytes of, code space if using the LCALL instruction.
  - a) 8 b) 16
  - d) 64 c) 32
- 8) In 8051, SP register is \_\_\_\_\_ bit wide.
  - a) 8 b)
    - c) 32 d)

**SLR-FM-251** 



14

14

9)	What is the address of DPL	
----	----------------------------	--

- 82H a) 83H b)
- 81H 88H c) d)
- In microcontroller & LCD interface, which line will instruct the LCD that 10) microcontroller sending a data or command?
  - DB0 b) RW a) c) EN
    - d) RS

Set S

#### What are the address of SFR's IE, IP, PSW & TH 0 respectively? 11)

- a) 99h,88h,90h,81h 87h,d 0h,8bh,8ch b)
- c) a8h,b8h,d 0h,8ch d) 98h,89h,d 0h,8ah
- Out of following registers, which register is not bit addressable register? 12) TCON
  - a) PSW b) c) SBUF d) IE
- Which of the following FSR is used for indirect addressing mode of PIC? 13)
  - a) INTCON INDF b)
  - c) PCL d) **STATUS**
- 14) The PIC actually uses a \_\_\_\_\_ program counter.
  - 12 bit b) 13 bit a)
  - c) 14 bit d) 15 bit

Set

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### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any three.

- a) Explain following instructions.
  - 1) MOVC A, @A+PC
  - 2) DIV AB
  - 3) JNB 00h, relative address.
  - 4) XCHD.
- **b)** Assuming Crystal frequency is of 12MHz, Write a assembly language program to generate square wave of 100Hz frequency on pin P1.3 using timer.
- c) State from which memory (External program /Internal program /Internal Data/External Data) Data will be transfer for following Underlined instructions. (Consider EA bar = 1 or +5v & A=00h)
  - 1) MOV DPTR,#0EFFFh MOVC A,@A+DPTR
  - 2) MOV DPTR,#0030h
     MOVC A,@ A+DPTR
  - 3) MOV DPTR,#3FFFH MOVX A,@DPTR
  - 4) <u>MOV R1,8</u>
- d) Explain the SFRs associated with the interrupt structure of 8051.

### Q.3 Solve any two.

- a) Explain timer module with GATE input bit and INTx pin. Also explain in detail all modes of timer of Microcontroller 8051.
- **b)** Draw interfacing Diagram and Write a program to display data "SUS Solapur" on 16x2 LCD Display.
- c) Draw Interfacing of 4\*4 matrix keyboard & 7 segment display to 8051 and Write ALP to display on Seven segment display no. (From 0-f) pressed on 4\*4 Matrix keyboard.

#### Section – II

### Q.4 Solve any three.

- a) Explain the following instructions.
  - 1) Clrwdt
  - 2) Incfsz
- b) Give the steps to be followed for doing A/D conversion in PIC16F877.
- c) Explain the memory organization of PIC 16F877.
- d) Explain and give necessity of Brown out reset and Watch Dog Timer in embedded system.

Max. Marks: 56

16

12

### Set S 16

### Q.5 Solve any two.

- a) Explain CCP1 module, how it is used for compare function along with Timer1?
- **b)** Explain different addressing modes of PIC. Write assembly language program for addition of two 16 bit numbers.
- c) Explain in detail  $I^2C$  bus for PIC16F877.
# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN

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 if necessary.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

1) SCR is used in a) Voltage control applications b) high voltage high frequency None C) d) \_\_\_\_ device. 2) SCR is a a) PNPN b) NNNP c) PPPN d) NPNP 3) Fan regular is based on \_\_\_\_ a) DC voltage controlling b) AC voltage controlling c) Both a and b None d) TRIAC is antiparallel arrangement of 4) SCR a) Diodes b) c) Transistors d) None In frequency synthesizer \_\_\_\_\_ IC is used. 5) a) IC 1596 b) IC 565 c) CD 4046 d) None 6) Timer is designed using \_\_\_\_\_. XR 2240 b) PT 100 a) C) LM394 d) 1 N4007 PLC exchanges information via 7) Cables b) Sensors a) Input and output modules c) d) Output device 8) DC Drive is based on a) Phase angle control b) Frequency control c) time control d) none IC 74C926 is used for \_\_\_\_\_. 9) a) Event counting b) Time Time and event c) d) None

Set

**SLR-FM-252** 

Max. Marks: 70

Marks: 14

Set P

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# **SLR-FM-252** Set P

#### 10) XR2240 consists of \_\_\_\_\_.

- a) 8 bit programmable counter
- c) 8 digit programmable counter
- Diac contains \_\_\_\_\_ diodes. 11)
  - a) 1 c) 3
- Triac contains \_\_\_\_\_ diodes. 12) a) 1 C)
  - 3 d)
- Timer counter is designed by \_\_\_\_\_ IC. 13) a) IC XR 2240 b)
  - c) Both a and b
- IC 1596 is used for \_\_\_\_\_. 14)
  - a) Modulation
  - c) Both a and b

- b) 4 bit programmable counter
- 4 digit programmable counter d)
- b) 2
- 4 d)
- 2 b) None
  - 74C96
  - d) None
  - b) Demodulation
  - d) None

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#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Set

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ucti	<ul> <li><b>ons:</b> 1) All Questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Assume suitable data if necessary.</li> </ul>		
	Section – I		
Atte a) b) c) d)	empt any three of the following questions. Explain construction and working of SCR. Explain difference between FSK demodulator and PSK demodulator. Explain design of frequency synthesizer using LM 565 and CD 4046. Compare between TRIAC and DIAC.	12	
Atte a) b)	empt any one of the following questions. Explain the AC power controlling with DIAC and TRIAC with suitable examples. Explain VI characteristics of DIAC and TRIAC.	08	
1.4 What are the different Commutation techniques of SCR? Also explain firing circuits of SCR.			
	Section – II		
Atte a) b) c) d)	empt any three of the following questions. Explain in detail J and K type Thermocouple. Explain design of counter using IC74C926. What is on/off and Propetional Control? Explain in brief. Differentiate between V to V, I to V and V to I converter.	12	
Att	empt any one of the following questions.	08	
	Atta a) b) c) d) Atta a) b) Wh circ Atta a) b) c) c) d) Atta	<ul> <li>uctions: 1) All Questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Assume suitable data if necessary.</li> <li>Section – I</li> <li>Attempt any three of the following questions.</li> <li>a) Explain construction and working of SCR.</li> <li>b) Explain difference between FSK demodulator and PSK demodulator.</li> <li>c) Explain design of frequency synthesizer using LM 565 and CD 4046.</li> <li>d) Compare between TRIAC and DIAC.</li> <li>Attempt any one of the following questions.</li> <li>a) Explain the AC power controlling with DIAC and TRIAC with suitable examples.</li> <li>b) Explain VI characteristics of DIAC and TRIAC.</li> <li>What are the different Commutation techniques of SCR? Also explain firing circuits of SCR.</li> <li>a) Explain in detail J and K type Thermocouple.</li> <li>b) Explain design of counter using IC74C926.</li> <li>c) What is on/off and Propetional Control? Explain in brief.</li> <li>d) Differentiate between V to V, I to V and V to I converter.</li> </ul>	

### Q.7Explain design procedure for 3.5 digit multirange digital voltmeter.08

# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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.

**ELECTRONICS APPLICATIONS & SYSTEM DESIGN** 

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

3)

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

b)

- DC Drive is based on \_\_\_\_\_ 1)
  - a) Phase angle control
  - c) time control
- IC 74C926 is used for \_\_\_\_\_. 2)
  - a) Event counting
  - c) Time and event
  - XR2240 consists of \_\_\_\_\_.
    - a) 8 bit programmable counter
    - c) 8 digit programmable counter
- Diac contains \_\_\_\_\_ diodes. 4)
  - 1 a)
  - c) 3 d)
- Triac contains \_\_\_\_\_ diodes. 5)
  - 1 b) a) 3
  - C) d)
- Timer counter is designed by \_\_\_\_\_ IC. 6) a) IC XR 2240
  - Both a and b c)
- IC 1596 is used for \_\_\_\_\_. 7) a) Modulation
  - Both a and b C)
- 8) SCR is used in \_\_\_\_\_.
  - a) Voltage control applications high frequency c)
- SCR is a <u>device</u>. 9)
  - a) PNPN
  - c) PPPN
- 10) Fan regular is based on \_\_\_\_\_
  - a) DC voltage controlling
  - Both a and b c)

d) none

Frequency control

- b) Time
- d) None
- b) 4 bit programmable counter
- 4 digit programmable counter d)
- 4

b)

- 2
  - None

2

74C96 b)

- d) None
- b) Demodulation
- d) None
- b) high voltage
- d)
- NNNP b)
- d) NPNP
- AC voltage controlling b)
- None d)

**SLR-FM-252** 



Max. Marks: 70

Marks: 14

- None

SLR-FM-252 Set Q

11)	TRI a) c)	AC is antiparallel arrangement of Diodes Transistors	b) d)	 SCR None
12)	In fr a) c)	equency synthesizer IC is IC 1596 CD 4046	used b) d)	IC 565 None
13)	Tim a) c)	er is designed using XR 2240 LM394	b) d)	PT 100 1 N4007
14)	PLC a) c)	exchanges information via Cables Input and output modules	b) d)	Sensors Output device

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#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Set

Q

Time	: 10	:00 AM To 01:00 PM		
Instr	ucti	<ul> <li>ons: 1) All Questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Assume suitable data if necessary.</li> </ul>		
		Section – I		
Q.2	Att a) b) c) d)	empt any three of the following questions. Explain construction and working of SCR. Explain difference between FSK demodulator and PSK demodulator. Explain design of frequency synthesizer using LM 565 and CD 4046. Compare between TRIAC and DIAC.	12	
Q.3	Att a) b)	empt any one of the following questions. Explain the AC power controlling with DIAC and TRIAC with suitable examples. Explain VI characteristics of DIAC and TRIAC.	08	
Q.4	<b>2.4</b> What are the different Commutation techniques of SCR? Also explain firing circuits of SCR.			
		Section – II		
Q.5	Att a) b) c) d)	empt any three of the following questions. Explain in detail J and K type Thermocouple. Explain design of counter using IC74C926. What is on/off and Propetional Control? Explain in brief. Differentiate between V to V, I to V and V to I converter.	12	
Q.6	Att a) b)	<b>empt any one of the following questions.</b> Explain PLC architecture and Applications. Write short note on bottle filling plant and elevator control.	08	
Q.7	Exp	blain design procedure for 3.5 digit multirange digital voltmeter.	08	

# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN**

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.
- Assume suitable 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

- In frequency synthesizer \_\_\_\_\_ IC is used. 1)
- a) IC 1596 b) IC 565 c) CD 4046 d) None 2) Timer is designed using \_\_\_\_\_. a) XR 2240 PT 100 b) c) LM394 d) 1 N4007 3) PLC exchanges information via \_\_\_\_ a) Cables Sensors b) c) Input and output modules d) Output device DC Drive is based on 4) a) Phase angle control b) Frequency control c) time control d) none IC 74C926 is used for \_\_\_\_\_. 5) a) Event counting b) Time Time and event None c) d) XR2240 consists of \_\_\_\_\_. 6) 8 bit programmable counter b) 4 bit programmable counter a) 8 digit programmable counter 4 digit programmable counter c) d) Diac contains \_\_\_\_\_ diodes. 7) 2 a) 1 b) 4 C) 3 d) Triac contains \_\_\_\_\_ diodes. 8) 2 a) 1 b) 3 c) d) None Timer counter is designed by \_\_\_\_\_ IC. 9) a) IC XR 2240 74C96 b) c) Both a and b d) None IC 1596 is used for \_\_\_\_\_. 10) a) Modulation Demodulation b) Both a and b c) d) None

**SLR-FM-252** 



Marks: 14

Max. Marks: 70

11) SCR is used in \_\_\_\_\_. a) Voltage control applications high voltage b) c) high frequency d) None 12) SCR is a \_\_\_\_\_ device. a) PNPN b) NNNP c) PPPN NPNP d) 13) Fan regular is based on \_\_\_\_\_. a) DC voltage controlling AC voltage controlling b) c) Both a and b d) None TRIAC is antiparallel arrangement of \_\_\_\_ 14) a) Diodes b) SCR c) Transistors d) None

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#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Set | R

Time	: 10:	00 AM To 01:00 PM		
Instr	ucti	<ul> <li>ons: 1) All Questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Assume suitable data if necessary.</li> </ul>		
		Section – I		
Q.2	Atte a) b) c) d)	empt any three of the following questions. Explain construction and working of SCR. Explain difference between FSK demodulator and PSK demodulator. Explain design of frequency synthesizer using LM 565 and CD 4046. Compare between TRIAC and DIAC.	12	
Q.3	Atte a) b)	empt any one of the following questions. Explain the AC power controlling with DIAC and TRIAC with suitable examples. Explain VI characteristics of DIAC and TRIAC.	08	
Q.4	<ul> <li>What are the different Commutation techniques of SCR? Also explain firing circuits of SCR.</li> </ul>			
		Section – II		
Q.5	Atte a) b) c) d)	empt any three of the following questions. Explain in detail J and K type Thermocouple. Explain design of counter using IC74C926. What is on/off and Propetional Control? Explain in brief. Differentiate between V to V, I to V and V to I converter.	12	
Q.6	Atte a) b)	empt any one of the following questions. Explain PLC architecture and Applications. Write short note on bottle filling plant and elevator control.	80	

### Q.7Explain design procedure for 3.5 digit multirange digital voltmeter.08

# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

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.

**ELECTRONICS APPLICATIONS & SYSTEM DESIGN** 

- 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 and rewrite the sentence. 14

d)

None

1) XR2240 consists of \_\_\_\_

CD 4046

C)

- a) 8 bit programmable counter b)
- c) 8 digit programmable counter d) 4 digit programmable counter

2)	Dia a) c)	c contains diodes. 1 3	b) d)	2 4
3)	Tria a) c)	ic contains diodes. 1 3	b) d)	2 None
4)	Tim a) c)	er counter is designed by IC XR 2240 Both a and b	IC. b) d)	74C96 None
5)	IC 1 a) c)	596 is used for Modulation Both a and b	b) d)	Demodulation None
6)	SCI a) c)	R is used in Voltage control applications high frequency	b) d)	high voltage None
7)	SCI a) c)	R is a device. PNPN PPPN	b) d)	NNNP NPNP
8)	Fan a) c)	regular is based on DC voltage controlling Both a and b	b) d)	AC voltage controlling None
9)	TRI a) c)	AC is antiparallel arrangeme Diodes Transistors	nt of b) d)	 SCR None
10)	In fr a)	equency synthesizer	IC is used. b)	IC 565

	-	

### SLR-FM-252



Set

Max. Marks: 70

Marks: 14

4 bit programmable counter

**SLR-FM-252** Set S

#### Timer is designed using \_\_\_\_\_. 11) a) XR 2240 b) PT 100 d) 1 N4007

- c) LM394
- PLC exchanges information via \_\_\_\_ 12)
  - a) Cables
  - c) Input and output modules
- 13) DC Drive is based on \_\_\_\_\_. a) Phase angle control c) time control
- IC 74C926 is used for \_\_\_\_\_. 14)
  - a) Event counting
  - c) Time and event

- \_. b) Sensors
- d) Output device
- b) Frequency control
- d) none
- b) Time
- None d)

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#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Set

S

Time	: 10	00 AM To 01:00 PM	
Instr	ucti	<ul> <li>ons: 1) All Questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Assume suitable data if necessary.</li> </ul>	
		Section – I	
Q.2	Att a) b) c) d)	empt any three of the following questions. Explain construction and working of SCR. Explain difference between FSK demodulator and PSK demodulator. Explain design of frequency synthesizer using LM 565 and CD 4046. Compare between TRIAC and DIAC.	12
Q.3	Att a) b)	empt any one of the following questions. Explain the AC power controlling with DIAC and TRIAC with suitable examples. Explain VI characteristics of DIAC and TRIAC.	08
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		Section – II	
Q.5	Att a) b) c) d)	empt any three of the following questions. Explain in detail J and K type Thermocouple. Explain design of counter using IC74C926. What is on/off and Propetional Control? Explain in brief. Differentiate between V to V, I to V and V to I converter.	12
Q.6	Att a) b)	empt any one of the following questions. Explain PLC architecture and Applications. Write short note on bottle filling plant and elevator control.	08
-			

#### **Q.7** Explain design procedure for 3.5 digit multirange digital voltmeter. **08**

## Set T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Low

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Objective paper should be returned in first 30 minutes.

- 2) Figures to the right indicates full marks.
  - 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**OPTICAL COMMUNICATION** 

**Duration: 30 Minutes** 

Seat

No.

Q.1

sentence. Intrinsic absorption is \_\_\_\_\_ in ultra violet portion of electromagnetic 1) spectrum as compared to visible and infrared portion.

Choose the correct alternatives from the options and rewrite the

- same b) verv weak a)
- d) none of these c) very strong
- 2) As compared to multimode step index fiber, a step index fiber has a intermodal dispersion.
  - High a) b)
  - c) Same d) None of these
- A multimode graded index fiber has a total pulse broadening of 0.2 µs 3) over a distance of 15 km. Then the pulse dispersion per unit length is
  - 6.67 ns km<sup>-1</sup> b) 13.34 ns km<sup>-1</sup> a)
  - c) 0.133 ns km<sup>-1</sup> 0.266 ns km<sup>-1</sup> d)
- Which of the following fiber manufacturing techniques can be used to 4) draw fiber continuously?
  - a) Vapour Axial Deposition
  - b) Modified chemical deposition technique
  - c) Plasma activated chemical deposition technique
  - d) b and c above
- 5) A fiber splice is a \_\_\_\_\_ joint formed between two individual optical fibers in field or factory.
  - a) Permanent Temporary b)
  - c) Permanent or Temporary d) None of the above
- An anisotype heterojunction is a \_\_\_\_\_ junction. 6)
  - a) n-n b) p-p c) p-n
    - a & b above d)
- Which of the following is an advantage of a plastic optical fiber as 7) compared to glass fiber?
  - a) Reduced requirement for a buffer jacket
  - b) Cheaper to produce
  - c) Easier to handle
  - d) All of the above

SLR-FM-253



Max. Marks: 70

Marks: 14

Set

- 8) Responsivity of photo diode is expressed in
  - a) A/W A-W b) A<sup>2</sup>-W
  - c) W/A d)
- Speed of response of detector is limited by \_\_\_\_ 9)
  - drift time of carrier through the carrier through depletion region a)
  - b) diffusion time of the carrier generated outside the depletion region
  - c) time constant incurred by the capacitance of photodiode with its load
  - d) all the above
- 10) Transmission of multiple optical signals over same fiber is used \_\_\_\_\_.
  - to increase the transmission capacity of the fiber a)
  - b) to increase the core diameter of the fiber
  - c) to increase the cladding diameter of the fiber
  - d) none of the above

a) Dispersion

- Interferometric technique is used to measure \_\_\_\_ 11)
  - b) Numerical aperture
  - c) Refractive index profile d) Total attenuation
- 12) Frequency domain measurements is the preferred method for acquiring the of multimode optical fibers.
  - a) Bandwidth b)
  - c) Dispersion
- Frequency d) Wavelength

- 13) WDM means
  - a) Wave Division Multiplexing
  - b) Wavelength Division Multiplexing
  - c) Width Division Multiplexing
  - d) None of the above
- 14) A photodiode has a quantum efficiency of 70% when photons of energy 1.8×10<sup>-19</sup>J are incident upon it, then the responsivity of the photodiode is
  - a) 0.694 b) 0.723 d) c) 0.369 0.623

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full mark.

#### Section – I

### Q.2 Solve any three of the followings.

- a) Determine the cutoff wavelength of a step index fiber to exhibit single mode operation when the core refractive index and radius are 1.46 and 4.5µm, respectively, with the relative index difference being 0.25 %
- b) A multimode graded index fiber exhibits total pulse broadening of 0.1 µs over a distance of 15 km. Estimate:
  - 1) the maximum bandwidth on the link assuming no intersymbol interference.
  - 2) the pulse dispersion per unit length
- c) Explain snug tube and V groove mechanical splices.
- d) Write a note on index guided LASERs.

### Q.3 Solve any two of the followings.

- a) Explain the following terms
  - 1) Total internal reflection
  - 2) Acceptance angle
  - 3) Numerical aperture
  - 4) Skew ray
- **b)** Compare different vapour phase deposition techniques with reference to reaction type, depositional direction and refractive index profile formation.
- c) Why heterojunctions are preferred in an injection LASER? Explain the operation of a double heterojunction injection LASER with help of energy band diagram.

#### Section – II

### Q.4 Solve any three of the followings.

- a) Explain the working of surface emitter LED.
- **b)** Explain the working principle of phototransistor.
- c) Explain the receiver design for optical communication.
- d) Explain briefly the cut off wavelength measurements.

### Q.5 Solve any two of the followings.

- a) When 10<sup>11</sup> photons per second each with an energy of 1.28×10<sup>-19</sup>J are incident on an ideal photodiode, calculate:
  - 1) the wavelength of the incident radiation
  - 2) the output photocurrent
  - 3) the output photocurrent if the device is an APD with a multiplication factor of 18.
- **b)** Compare LED with Laser based on principle, construction, advantages and disadvantages.
- c) Explain FDDI network.

Max. Marks: 56

Set

12

16

16

Seat	
No.	

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) Objective paper should be returned in first 30 minutes.

- 2) Figures to the right indicates full marks.
  - 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
  - 1) Responsivity of photo diode is expressed in \_\_\_\_\_.

a)	A/W	b)	A-W
C)	W/A	d)	A <sup>2</sup> -W

- 2) Speed of response of detector is limited by \_\_\_\_\_
  - a) drift time of carrier through the carrier through depletion region
  - b) diffusion time of the carrier generated outside the depletion region
  - c) time constant incurred by the capacitance of photodiode with its load
  - d) all the above

#### 3) Transmission of multiple optical signals over same fiber is used \_\_\_\_\_.

- a) to increase the transmission capacity of the fiber
- b) to increase the core diameter of the fiber
- c) to increase the cladding diameter of the fiber
- d) none of the above

#### 4) Interferometric technique is used to measure \_\_\_\_\_.

- a) Dispersion b) Numerical aperture
- c) Refractive index profile d) Total attenuation
- 5) Frequency domain measurements is the preferred method for acquiring the \_\_\_\_\_ of multimode optical fibers.
  - a) Bandwidth b) Frequency
  - c) Dispersion d) Wavelength
- 6) WDM means \_\_\_\_
  - a) Wave Division Multiplexing
  - b) Wavelength Division Multiplexing
  - c) Width Division Multiplexing
  - d) None of the above
- A photodiode has a quantum efficiency of 70% when photons of energy 1.8×10<sup>-19</sup>J are incident upon it, then the responsivity of the photodiode is \_\_\_\_\_.
  - a) 0.694 b) 0.723
  - c) 0.369 d) 0.623



Max. Marks: 70

Marks: 14

Set Q

- 8) Intrinsic absorption is \_\_\_\_\_ in ultra violet portion of electromagnetic spectrum as compared to visible and infrared portion.
  - a) same

- b) very weakd) none of these
- c) very strong d)
- As compared to multimode step index fiber, a step index fiber has a \_\_\_\_\_ intermodal dispersion.
  - a) High c) Same

- b) Low
- d) None of these
- 10) A multimode graded index fiber has a total pulse broadening of 0.2 µs over a distance of 15 km. Then the pulse dispersion per unit length is
  - a) 6.67 ns km<sup>-1</sup>

- b) 13.34 ns km<sup>-1</sup>
- c) 0.133 ns km<sup>-1</sup> d) 0.266 ns km<sup>-1</sup>
- 11) Which of the following fiber manufacturing techniques can be used to draw fiber continuously?
  - a) Vapour Axial Deposition
  - b) Modified chemical deposition technique
  - c) Plasma activated chemical deposition technique
  - d) b and c above
- 12) A fiber splice is a \_\_\_\_\_ joint formed between two individual optical fibers in field or factory.
  - a) Permanent
  - c) Permanent or Temporary
- b) Temporary
- d) None of the above
- 13) An anisotype heterojunction is a \_\_\_\_\_ junction.
  - a) n-n b) p-p
  - c) p-n d) a & b above
- 14) Which of the following is an advantage of a plastic optical fiber as compared to glass fiber?
  - a) Reduced requirement for a buffer jacket
  - b) Cheaper to produce
  - c) Easier to handle
  - d) All of the above

Seat No.

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPTICAL COMMUNICATION**

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 mark.

#### Section – I

#### Q.2 Solve any three of the followings.

- a) Determine the cutoff wavelength of a step index fiber to exhibit single mode operation when the core refractive index and radius are 1.46 and 4.5µm, respectively, with the relative index difference being 0.25 %
- A multimode graded index fiber exhibits total pulse broadening of 0.1 µs b) over a distance of 15 km. Estimate:
  - the maximum bandwidth on the link assuming no intersymbol 1) interference.
  - the pulse dispersion per unit length 2)
- Explain snug tube and V groove mechanical splices. c)
- Write a note on index guided LASERs. d)

#### Q.3 Solve any two of the followings.

- Explain the following terms a)
  - Total internal reflection 1)
  - 2) Acceptance angle
  - 3) Numerical aperture
  - 4) Skew rav
- Compare different vapour phase deposition techniques with reference to b) reaction type, depositional direction and refractive index profile formation.
- Why heterojunctions are preferred in an injection LASER? Explain the C) operation of a double heterojunction injection LASER with help of energy band diagram.

#### Section – II

#### Solve any three of the followings. Q.4

- Explain the working of surface emitter LED. a)
- b) Explain the working principle of phototransistor.
- Explain the receiver design for optical communication. c)
- Explain briefly the cut off wavelength measurements. d)

#### Solve any two of the followings. Q.5

- When  $10^{11}$  photons per second each with an energy of  $1.28 \times 10^{-19}$  J are a) incident on an ideal photodiode, calculate:
  - 1) the wavelength of the incident radiation
  - 2) the output photocurrent
  - the output photocurrent if the device is an APD with a multiplication 3) factor of 18.
- Compare LED with Laser based on principle, construction, advantages and b) disadvantages.
- Explain FDDI network. C)

Max. Marks: 56

SLR-FM-253

16

12

16



### Seat No.

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPTICAL COMMUNICATION**

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Objective paper should be returned in first 30 minutes.

- 2) Figures to the right indicates full marks.
  - 3) Assume suitable data if necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
  - 1) A fiber splice is a joint formed between two individual optical fibers in field or factory.
    - a) Permanent

- Temporary b)
- None of the above d)
- 2) An anisotype heterojunction is a \_\_\_\_\_ junction.
  - b) a) n-n p-p
    - d) a & b above c) p-n
- Which of the following is an advantage of a plastic optical fiber as 3) compared to glass fiber?
  - a) Reduced requirement for a buffer jacket
  - b) Cheaper to produce

c) Permanent or Temporary

- c) Easier to handle
- d) All of the above
- Responsivity of photo diode is expressed in 4)
  - A-W a) A/W b)
  - c) W/A  $A^2-W$ d)
- Speed of response of detector is limited by \_\_\_\_ 5)
  - a) drift time of carrier through the carrier through depletion region
  - b) diffusion time of the carrier generated outside the depletion region
  - time constant incurred by the capacitance of photodiode with its load c)
  - d) all the above
- 6) Transmission of multiple optical signals over same fiber is used .
  - to increase the transmission capacity of the fiber a)
  - b) to increase the core diameter of the fiber
  - c) to increase the cladding diameter of the fiber
  - d) none of the above
- Interferometric technique is used to measure 7) a) Dispersion
  - Numerical aperture b)
  - c) Refractive index profile d) Total attenuation
- Frequency domain measurements is the preferred method for acquiring 8) the of multimode optical fibers.
  - a) Bandwidth Frequency b)
  - c) Dispersion d) Wavelength

Max. Marks: 70

Marks: 14

14

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- 9) WDM means \_\_\_\_\_.
  - a) Wave Division Multiplexing
  - b) Wavelength Division Multiplexing
  - c) Width Division Multiplexing
  - d) None of the above
- 10) A photodiode has a quantum efficiency of 70% when photons of energy 1.8×10<sup>-19</sup>J are incident upon it, then the responsivity of the photodiode is \_\_\_\_\_.
  - a) 0.694 b) 0.723
  - c) 0.369 d) 0.623
- 11) Intrinsic absorption is \_\_\_\_\_ in ultra violet portion of electromagnetic spectrum as compared to visible and infrared portion.
  - a) same b) very weak
  - c) very strong d) none of these
- 12) As compared to multimode step index fiber, a step index fiber has a \_\_\_\_\_ intermodal dispersion.
  - a) High

b) Low

**SLR-FM-253** 

Set

- c) Same d) None of these
- 13) A multimode graded index fiber has a total pulse broadening of 0.2 µs over a distance of 15 km. Then the pulse dispersion per unit length is
  - a) 6.67 ns km<sup>-1</sup> b) 13.34 ns km<sup>-1</sup>
  - c) 0.133 ns km<sup>-1</sup> d) 0.266 ns km<sup>-1</sup>
- 14) Which of the following fiber manufacturing techniques can be used to draw fiber continuously?
  - a) Vapour Axial Deposition
  - b) Modified chemical deposition technique
  - c) Plasma activated chemical deposition technique
  - d) b and c above

# Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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 mark.

#### Section – I

#### Q.2 Solve any three of the followings.

- a) Determine the cutoff wavelength of a step index fiber to exhibit single mode operation when the core refractive index and radius are 1.46 and 4.5µm, respectively, with the relative index difference being 0.25 %
- b) A multimode graded index fiber exhibits total pulse broadening of 0.1 µs over a distance of 15 km. Estimate:
  - 1) the maximum bandwidth on the link assuming no intersymbol interference.
  - 2) the pulse dispersion per unit length
- c) Explain snug tube and V groove mechanical splices.
- d) Write a note on index guided LASERs.

#### Q.3 Solve any two of the followings.

- **a)** Explain the following terms
  - 1) Total internal reflection
  - 2) Acceptance angle
  - 3) Numerical aperture
  - 4) Skew ray
- **b)** Compare different vapour phase deposition techniques with reference to reaction type, depositional direction and refractive index profile formation.
- c) Why heterojunctions are preferred in an injection LASER? Explain the operation of a double heterojunction injection LASER with help of energy band diagram.

#### Section – II

#### Q.4 Solve any three of the followings.

- a) Explain the working of surface emitter LED.
- b) Explain the working principle of phototransistor.
- c) Explain the receiver design for optical communication.
- d) Explain briefly the cut off wavelength measurements.

#### Q.5 Solve any two of the followings.

- a) When 10<sup>11</sup> photons per second each with an energy of 1.28×10<sup>-19</sup>J are incident on an ideal photodiode, calculate:
  - 1) the wavelength of the incident radiation
  - 2) the output photocurrent
  - 3) the output photocurrent if the device is an APD with a multiplication factor of 18.
- **b)** Compare LED with Laser based on principle, construction, advantages and disadvantages.
- c) Explain FDDI network.

Max. Marks: 56

Set

12

16

16

# Seat No.

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPTICAL COMMUNICATION**

Day & Date: Tuesday, 26-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) Objective paper should be returned in first 30 minutes.

- 2) Figures to the right indicates full marks.
  - 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
  - 1) Transmission of multiple optical signals over same fiber is used .
    - to increase the transmission capacity of the fiber a)
    - to increase the core diameter of the fiber b)
    - to increase the cladding diameter of the fiber c)
    - d) none of the above
  - 2) Interferometric technique is used to measure \_\_\_\_\_.
    - a) Dispersion b) Numerical aperture
    - c) Refractive index profile d) Total attenuation
  - Frequency domain measurements is the preferred method for acquiring 3) the of multimode optical fibers.
    - a) Bandwidth b) Frequency
    - c) Dispersion d) Wavelength
  - WDM means \_\_\_\_\_. 4)
    - a) Wave Division Multiplexing
    - b) Wavelength Division Multiplexing
    - c) Width Division Multiplexing
    - d) None of the above
  - A photodiode has a quantum efficiency of 70% when photons of energy 5) 1.8×10<sup>-19</sup>J are incident upon it, then the responsivity of the photodiode is
    - a) 0.694 b) 0.723
    - c) 0.369 d) 0.623
  - Intrinsic absorption is \_\_\_\_\_ in ultra violet portion of electromagnetic 6) spectrum as compared to visible and infrared portion.
    - a) same b) very weak
    - c) very strong d) none of these
  - 7) As compared to multimode step index fiber, a step index fiber has a intermodal dispersion. Low
    - High a)
    - b) c) Same None of these d)



Max. Marks: 70

Marks: 14

- 8) A multimode graded index fiber has a total pulse broadening of 0.2 µs over a distance of 15 km. Then the pulse dispersion per unit length is
  - 6.67 ns km<sup>-1</sup> a)

- 13.34 ns km<sup>-1</sup> b) 0.266 ns km<sup>-1</sup>
- c) 0.133 ns km<sup>-1</sup> d)
- 9) Which of the following fiber manufacturing techniques can be used to draw fiber continuously?
  - a) Vapour Axial Deposition
  - b) Modified chemical deposition technique
  - c) Plasma activated chemical deposition technique
  - d) b and c above
- A fiber splice is a \_\_\_\_\_ joint formed between two individual optical fibers 10) in field or factory.
  - a) Permanent c) Permanent or Temporary
- b) Temporary None of the above d)
- An anisotype heterojunction is a \_\_\_\_\_ junction. 11)
  - b) a) n-n
  - c) p-n d)
- Which of the following is an advantage of a plastic optical fiber as 12) compared to glass fiber?
  - a) Reduced requirement for a buffer jacket
  - b) Cheaper to produce
  - c) Easier to handle
  - d) All of the above
- Responsivity of photo diode is expressed in 13)
  - A-W a) A/W b)
  - c) W/A d)  $A^2-W$
- Speed of response of detector is limited by 14)
  - a) drift time of carrier through the carrier through depletion region
  - b) diffusion time of the carrier generated outside the depletion region
  - c) time constant incurred by the capacitance of photodiode with its load
  - d) all the above

Set

- p-p
- a & b above

#### Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPTICAL COMMUNICATION

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 mark.

#### Section – I

#### Q.2 Solve any three of the followings.

- a) Determine the cutoff wavelength of a step index fiber to exhibit single mode operation when the core refractive index and radius are 1.46 and 4.5µm, respectively, with the relative index difference being 0.25 %
- b) A multimode graded index fiber exhibits total pulse broadening of 0.1 µs over a distance of 15 km. Estimate:
  - 1) the maximum bandwidth on the link assuming no intersymbol interference.
  - 2) the pulse dispersion per unit length
- c) Explain snug tube and V groove mechanical splices.
- d) Write a note on index guided LASERs.

#### Q.3 Solve any two of the followings.

- **a)** Explain the following terms
  - 1) Total internal reflection
  - 2) Acceptance angle
  - 3) Numerical aperture
  - 4) Skew ray
- **b)** Compare different vapour phase deposition techniques with reference to reaction type, depositional direction and refractive index profile formation.
- c) Why heterojunctions are preferred in an injection LASER? Explain the operation of a double heterojunction injection LASER with help of energy band diagram.

#### Section – II

#### Q.4 Solve any three of the followings.

- a) Explain the working of surface emitter LED.
- b) Explain the working principle of phototransistor.
- c) Explain the receiver design for optical communication.
- d) Explain briefly the cut off wavelength measurements.

#### Q.5 Solve any two of the followings.

- a) When 10<sup>11</sup> photons per second each with an energy of 1.28×10<sup>-19</sup>J are incident on an ideal photodiode, calculate:
  - 1) the wavelength of the incident radiation
  - 2) the output photocurrent
  - 3) the output photocurrent if the device is an APD with a multiplication factor of 18.
- **b)** Compare LED with Laser based on principle, construction, advantages and disadvantages.
- c) Explain FDDI network.

Max. Marks: 56

16

16

12



SLR-FM-253

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION

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.

#### MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

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

- 1) Advantage of using Dynamic channel assignment is \_\_\_\_\_.
  - a) Blocking is reduced
  - b) Capacity of the system is increased
  - c) Both a & b
  - d) None of the above
- 2) Trunking in a cellular network refers to \_\_\_\_\_.
  - a) Termination of a call
  - b) Spectrum unavailability
  - c) Accommodating large numbers of users in limited spectrum
  - d) All of the above
- 3) Co-channel reuse ratio for cluster size 12 is \_\_\_\_\_.
  - a) 4 b) 5 c) 6 d) 7
- 4) Friis free space equation \_\_\_\_\_.
  - a) Is an expression for noise power
  - b) Is a function of transmitting and receiving antenna gain
  - c) Depends upon the distance between transmitting and receiving antenna.
  - d) Both b & c
- 5) \_\_\_\_\_ is the Time Dispersion Parameter.
  - a) RMS delay spreadc) Excess delay spread
- b) Mean excess delayd) All of above
- 6) Data transmission for users of a \_\_\_\_\_ system is not continuous, but oocurs in bursts.
  - a) FDMA b) TDMA
  - c) SDMA d) SSMA
- 7) \_\_\_\_\_ requires tight RF filtering to minimize adjacent channel interference.
  - a) FDMA b) TDMA c) SDMA d) SSMA
- 8) Carrier Separation in Primary GSM system is of \_\_\_\_\_.
  - a) 200 KHz b) 300 KHz c) 400 KHz d) 500 KHz

SLR-FM-254



Max. Marks: 70

Marks: 14

Set P

9)	In G a) c)	SM one hyperframe is made o 2048 superframes 2084 superframes	f b) d)	2048 mutiframes 2084 mutiframes
10)	The inter a) c)	standard interface that connec face. Um A	ts a b) d)	MS to BTS is called the A-bis D
11)	The broa a) c)	channel is used for sen dcast message. Forward traffic Paging	ding b) d)	short message including Sync Pilot
12)	In IS a) c)	-95 CDMA forward channel ba 1.25 MHz 2 MHz	andw b) d)	ridth is of 1.40 MHz 3 MHz
13)	The a) c)	channel bandwidth in W-CDM 5 MHz 2 MHz	A is b) d)	4 MHz 1.5 MHz
14)	The a)	data modulation used in forwa BPSK	rd cl b)	nannel in W-CDMA system is QPSK

- a) BPSK c) Dual Channel QPSK
- d) OQPSK

Page **2** of **12** 

Seat		Sat	D
No.		Jei	
	T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION		
Day & Time:	& Date: Wednesday, 27-11-2019 Max. 10:00 AM To 01:00 PM	Marks	s: 56
Instru	<b>uctions:</b> 1) All questions are compulsory. 2) Figure to the right indicates full marks.		
	Section – I		
Q.2	<ul> <li>Attempt any three of the following questions.</li> <li>a) Explain frequency reuse concept in cellular systems.</li> <li>b) Explain Umbrella cell approach.</li> <li>c) Explain lag distance path lage model and lag permal checkening.</li> </ul>		12
	<ul> <li>c) Explain log-distance path loss model and log-normal shadowing.</li> <li>d) What is diversity? Explain in detail.</li> <li>e) Write a note on Space Division Multiple Access (SDMA).</li> </ul>		
Q.3	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain different methods used to improve capacity of cellular systems</li> <li>b) Elaborate the free space propagation model.</li> <li>c) Explain frame structure, features, efficiency and number of channels in TDMA system.</li> </ul>	s. 1	16
	Section – II		
Q.4	<ul> <li>Attempt any three of the following questions.</li> <li>a) Write a note on GPRS.</li> <li>b) Describe the types of Handoff in GSM.</li> <li>c) Explain GSM frame hierarchy</li> </ul>		12
	<ul> <li>d) Explain pilot channel, sync channel and paging channels in IS-95 C system.</li> <li>e) Explain reverse channel in W-CDMA.</li> </ul>	DMA	
Q.5	<ul> <li>Attempt any two of the following questions.</li> <li>a) Give the detail comparison of IS-95, WCDMA and CDMA 2000.</li> <li>b) Explain in detail GSM protocol architecture.</li> <li>c) Explain with neat block diagram Access channel processing and reverse traffic channel processing in IS-95 CDMA system.</li> </ul>	se	16

SLR-FM-254

Time	e. 10.00					
Instr	uction	i <b>s:</b> 1) Q t	. No. 1 is compulso book.	ory and should	be solved in first 30 minutes	in answer
		2) Fi	gures to the right in	dicate full mar	ks.	
			MCQ/Ob	jective Type	Questions	
Dura	ition: 30	0 Minut	es			Marks: 14
Q.1	Choo 1)	o <b>se the</b> Carrie a) c)	<b>correct alternative</b> or Separation in Prir 200 KHz 400 KHz	es from the o nary GSM sys b) d)	ptions and rewrite the sente stem is of 300 KHz 500 KHz	nce. 14
	2)	In GS a) c)	M one hyperframe 2048 superframes 2084 superframes	is made of b) d)	2048 mutiframes 2084 mutiframes	
	3)	The s interfa a) c)	tandard interface th ace. Um A	at connects a b) d)	MS to BTS is called the A-bis D	_
	4)	The _ broad a) c)	channel is use lcast message. Forward traffic Paging	ed for sending b) d)	g short message including Sync Pilot	
	5)	In IS- a) c)	95 CDMA forward c 1.25 MHz 2 MHz	hannel bandv b) d)	vidth is of 1.40 MHz 3 MHz	
	6)	The c a) c)	hannel bandwidth iı 5 MHz 2 MHz	n W-CDMA is b) d)	 4 MHz 1.5 MHz	
	7)	The d a) c)	lata modulation use BPSK Dual Channel QPSI	d in forward c b) ≺ d)	hannel in W-CDMA system is QPSK OQPSK	
	8)	Advaı a) b) c) d)	ntage of using Dyna Blocking is reduced Capacity of the syst Both a & b None of the above	imic channel a em is increas	assignment is ed	
	9)	Trunk a) b) c)	ting in a cellular net Termination of a cal Spectrum unavailab Accommodating lar	work refers to II pility ge numbers o	 f users in limited spectrum	

**Electronics & Telecommunication Engineering MOBILE COMMUNICATION** 

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Wednesday, 27-11-2019 Time: 10:00 AM To 01:00 PM

**SLR-FM-254** 

Set

Seat No.

> All of the above d)

Max. Marks: 70

Q

Set Q

- Co-channel reuse ratio for cluster size 12 is . 10)
  - a) 4

a)

- b) 5 6 d) 7 C)
- 11) Friis free space equation \_\_\_\_\_.
  - Is an expression for noise power a)
  - Is a function of transmitting and receiving antenna gain b)
  - Depends upon the distance between transmitting and receiving c) antenna.
  - Both b & c d)

#### 12) \_\_\_\_ is the Time Dispersion Parameter.

- RMS delay spread b) Mean excess delay
- Excess delay spread d) All of above C)
- Data transmission for users of a \_\_\_\_\_ system is not continuous, but 13) oocurs in bursts.
  - a) **FDMA** b) TDMA
  - C) **SDMA** d) SSMA
- 14) \_\_\_\_ requires tight RF filtering to minimize adjacent channel interference.
  - FDMA a)
  - C) SDMA

- b) TDMA
- d) SSMA

	SLR-FM-2	54
Seat No.	Set	Q
	T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION	
Day 8 Time:	& Date: Wednesday, 27-11-2019 Max. Marks : 10:00 AM To 01:00 PM	: 56
Instru	2) Figure to the right indicates full marks.	
	Section – I	
Q.2	<ul> <li>Attempt any three of the following questions.</li> <li>a) Explain frequency reuse concept in cellular systems.</li> <li>b) Explain Umbrella cell approach.</li> <li>c) Explain log-distance path loss model and log-normal shadowing.</li> <li>d) What is diversity? Explain in detail.</li> <li>e) Write a note on Space Division Multiple Access (SDMA).</li> </ul>	12
Q.3	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain different methods used to improve capacity of cellular systems.</li> <li>b) Elaborate the free space propagation model.</li> <li>c) Explain frame structure, features, efficiency and number of channels in TDMA system.</li> </ul>	16
	Section – II	
Q.4	<ul> <li>Attempt any three of the following questions.</li> <li>a) Write a note on GPRS.</li> <li>b) Describe the types of Handoff in GSM.</li> <li>c) Explain GSM frame hierarchy.</li> <li>d) Explain pilot channel, sync channel and paging channels in IS-95 CDMA system.</li> <li>e) Explain reverse channel in W-CDMA.</li> </ul>	12
Q.5	<ul> <li>Attempt any two of the following questions.</li> <li>a) Give the detail comparison of IS-95, WCDMA and CDMA 2000.</li> <li>b) Explain in detail GSM protocol architecture.</li> <li>c) Explain with neat block diagram Access channel processing and reverse traffic channel processing in IS-95 CDMA system.</li> </ul>	16

	a)	FDMA	b)	TDMA
	c)	SDMA	d)	SSMA
4)	Carr	ier Separation in Primary GSM	l sys	tem is of
	a)	200 KHz	b)	300 KHz
	c)	400 KHz	d)	500 KHz
5)	In G a) c)	SM one hyperframe is made of 2048 superframes 2084 superframes	f b) d)	2048 mutiframes 2084 mutiframes
6)	The inter a) c)	standard interface that connec face. Um A	ts a b) d)	MS to BTS is called the A-bis D
7)	The broa a) c)	channel is used for sen dcast message. Forward traffic Paging	ding b) d)	short message including Sync Pilot
8)	In IS	-95 CDMA forward channel ba	andw	vidth is of
	a)	1.25 MHz	b)	1.40 MHz
	c)	2 MHz	d)	3 MHz
9)	The	channel bandwidth in W-CDM	A is	
	a)	5 MHz	b)	4 MHz
	c)	2 MHz	d)	1.5 MHz
4.0	<b>—</b> .			

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**

**Electronics & Telecommunication Engineering MOBILE COMMUNICATION** 

**Duration: 30 Minutes** 

Day & Date: Wednesday, 27-11-2019

Time: 10:00 AM To 01:00 PM

Seat

No.

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

- is the Time Dispersion Parameter. 1)
  - RMS delay spread b) Mean excess delay
  - a) C)
    - Excess delay spread d) All of above
- Data transmission for users of a system is not continuous, but 2) oocurs in bursts.
  - **FDMA** b) TDMA a)
  - C) **SDMA** d) SSMA
- \_ requires tight RF filtering to minimize adjacent channel 3) interference.

- The data modulation used in forward channel in W-CDMA system is \_\_\_\_\_. 10) a)
  - BPSK b) QPSK
  - **Dual Channel QPSK** d) **OQPSK** c)

**SLR-FM-254** 

# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Set

Max. Marks: 70

Set R

- 11) Advantage of using Dynamic channel assignment is \_\_\_\_\_.
  - Blocking is reduced a)
  - Capacity of the system is increased b)
  - Both a & b C)
  - None of the above d)
- 12) Trunking in a cellular network refers to \_\_\_\_\_.
  - Termination of a call a)
  - Spectrum unavailability b)
  - Accommodating large numbers of users in limited spectrum C)
  - All of the above d)
- Co-channel reuse ratio for cluster size 12 is \_\_\_\_\_. 13)
  - b) 5 d) 7 a) 4
  - C) 6
- Friis free space equation \_\_\_\_. 14)
  - Is an expression for noise power a)
  - Is a function of transmitting and receiving antenna gain b)
  - Depends upon the distance between transmitting and receiving C) antenna.
  - Both b & c d)

Seat		Sot	D
No.		Jei	Γ
	T.E. (Part – I Electron	I) (OId) (CGPA) Examination Nov/Dec-2019 ics & Telecommunication Engineering MOBILE COMMUNICATION	
Day & Time:	& Date: Wednesday, 2 : 10:00 AM To 01:00 F	7-11-2019 Max. Mark PM	s: 56
Instru	u <b>ctions:</b> 1) All questic 2) Figure to t	ons are compulsory. The right indicates full marks.	
		Section – I	
Q.2	<ul> <li>Attempt any three o</li> <li>a) Explain frequence</li> <li>b) Explain Umbrella</li> </ul>	f the following questions. cy reuse concept in cellular systems. a cell approach	12
	<ul> <li>c) Explain log-dista</li> <li>d) What is diversity</li> <li>e) Write a note on</li> </ul>	ance path loss model and log-normal shadowing. ? Explain in detail. Space Division Multiple Access (SDMA).	
Q.3	<ul> <li>Attempt any two of a</li> <li>a) Explain different</li> <li>b) Elaborate the free</li> <li>c) Explain frame state</li> <li>TDMA system.</li> </ul>	the following questions. methods used to improve capacity of cellular systems. ee space propagation model. ructure, features, efficiency and number of channels in	16
	,	Section – II	
Q.4	<ul><li>Attempt any three o</li><li>a) Write a note on</li><li>b) Describe the typ</li></ul>	<b>f the following questions.</b> GPRS. les of Handoff in GSM.	12
	<ul> <li>c) Explain GSM fra</li> <li>d) Explain pilot cha system.</li> <li>e) Explain reverse</li> </ul>	annel, sync channel and paging channels in IS-95 CDMA	
05	Attempt any two of	the following questions	16
Q.J	<ul> <li>a) Give the detail c</li> <li>b) Explain in detail</li> <li>c) Explain with near traffic channel p</li> </ul>	comparison of IS-95, WCDMA and CDMA 2000. GSM protocol architecture. It block diagram Access channel processing and reverse rocessing in IS-95 CDMA system.	10

			MCQ/Objecti	ve Type	Questions	
Duration: 30 Minutes						
Q.1	<b>Choo</b> 1)	se th The inter a) c)	e correct alternatives fro standard interface that co fface. Um A	om the o onnects a b) d)	ptions and rewrite the sente MS to BTS is called the A-bis D	ence.
	2)	The broa a) c)	channel is used fo adcast message. Forward traffic Paging	br sending b) d)	short message including Sync Pilot	
	3)	In IS a) c)	8-95 CDMA forward chanr 1.25 MHz 2 MHz	nel bandv b) d)	vidth is of 1.40 MHz 3 MHz	
	4)	The a) c)	channel bandwidth in W- 5 MHz 2 MHz	CDMA is b) d)	4 MHz 1.5 MHz	
	5)	The a) c)	data modulation used in f BPSK Dual Channel QPSK	forward c b) d)	hannel in W-CDMA system is QPSK OQPSK	
	6)	Adv a) b) c) d)	<ul> <li>Advantage of using Dynamic channel assignment is</li> <li>a) Blocking is reduced</li> <li>b) Capacity of the system is increased</li> <li>c) Both a &amp; b</li> <li>d) None of the above</li> </ul>			
	7)	Trur a) b) c) d)	nking in a cellular network Termination of a call Spectrum unavailability Accommodating large nu All of the above	refers to umbers o	 f users in limited spectrum	
	8)	Co-o a)	channel reuse ratio for clu 4	ister size	12 is 5	

d) 7

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MOBILE COMMUNICATION**

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.

c)

6

Seat No.



Set

Max. Marks: 70

s: 14

Set S

- 9) Friis free space equation .
  - Is an expression for noise power a)
  - Is a function of transmitting and receiving antenna gain b)
  - Depends upon the distance between transmitting and receiving C) antenna.
  - Both b & c d)

a)

a)

- 10) is the Time Dispersion Parameter. RMS delay spread
  - b) Mean excess delay
  - Excess delay spread d) All of above C)
- Data transmission for users of a \_\_\_\_\_ system is not continuous, but 11) oocurs in bursts.
  - FDMA b) TDMA a)
  - C) **SDMA** d) SSMA
- 12) requires tight RF filtering to minimize adjacent channel interference.
  - FDMA
  - **SDMA** SSMA C) d)
- 13) Carrier Separation in Primary GSM system is of \_\_\_\_\_.
  - a) 200 KHz b) 300 KHz
  - C) 400 KHz d) 500 KHz
- 14) In GSM one hyperframe is made of \_\_\_\_\_
  - 2048 superframes a)
  - 2084 superframes c)
- b) 2048 mutiframes

b) TDMA

d) 2084 mutiframes

Page **11** of **12** 

	SLR-FM-2							
Seat No.	Set	S						
T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MOBILE COMMUNICATION								
Day & Time: Instru	& Date: Wednesday, 27-11-2019 Max. Marks : 10:00 AM To 01:00 PM uctions: 1) All questions are compulsory.	3: 56						
	2) Figure to the right indicates full marks. Section – I							
Q.2	<ul> <li>Attempt any three of the following questions.</li> <li>a) Explain frequency reuse concept in cellular systems.</li> <li>b) Explain Umbrella cell approach.</li> <li>c) Explain log-distance path loss model and log-normal shadowing.</li> <li>d) What is diversity? Explain in detail.</li> <li>e) Write a note on Space Division Multiple Access (SDMA).</li> </ul>	12						
Q.3	<ul> <li>Attempt any two of the following questions.</li> <li>a) Explain different methods used to improve capacity of cellular systems.</li> <li>b) Elaborate the free space propagation model.</li> <li>c) Explain frame structure, features, efficiency and number of channels in TDMA system.</li> <li>Section – II</li> </ul>	16						
Q.4	<ul> <li>Attempt any three of the following questions.</li> <li>a) Write a note on GPRS.</li> <li>b) Describe the types of Handoff in GSM.</li> <li>c) Explain GSM frame hierarchy.</li> <li>d) Explain pilot channel, sync channel and paging channels in IS-95 CDMA system.</li> <li>e) Explain reverse channel in W-CDMA.</li> </ul>	12						
Q.5	<ul> <li>Attempt any two of the following questions.</li> <li>a) Give the detail comparison of IS-95, WCDMA and CDMA 2000.</li> <li>b) Explain in detail GSM protocol architecture.</li> <li>c) Explain with neat block diagram Access channel processing and reverse traffic channel processing in IS-95 CDMA system.</li> </ul>	16						
# SLR-FM-255 Set

Seat	
No.	

**Duration: 20 Minutes** 

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering COMPUTER ORGANIZATION**

Day & Date: Thursday, 28-12-2019 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) Answer MCQ Objective type questions on Page No. 3 only

MCQ/Objective Type Questions

3) Figures to right indicate full marks.

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. The addressing mode, where operand value is directly specified is called \_\_\_\_\_. 1) Immediate b) Direct a) Definite d) Relative C)

#### 2) Which representation is most efficient to perform arithmetic operations?

- Sign magnitude b) 1's complements a) 2's complements d) None of these c)
- Which register points to the first instruction to be executed when the 3) processor starts.
  - a) Accumulator b) Program counter
  - c) Data register d) Instruction register
- 4) Speedup techniques of computer include \_
  - a) cache b) pipeline
  - c) superscalar d) all of these
- Floating point representation consist of \_ 5)
  - Mantissa b) exponent a) Both a) and b) d) none of these c)
- To read the control words sequentially 6) is used. IR PC b)
  - a) c) uPC d) None of these
- 7) Data used with assembly language instruction in processors are nothing but
  - a) Opcode b) Operand
  - None of these c) Register d)
- 8) In Processor DMA Stand for \_\_\_\_\_
  - a) Direct Memory Access b) **Division Memory Access**
  - **Direct mapping Access** All of the above c) d)

Max. Marks: 50

Marks: 10

#### 9) What is not true about RISC?

- a) Large no of addressing modes b)
- c) Hardwired control unit d)
- Simple instruction

SLR-FM-255

Set P

- A single chip processor
- To interface 2048 bytes of memory, how many address lines are 10) required?
  - a) 8 9 b) 10 d) 11 C)

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40



Day a Time	& Date : 10:00	e: Th 0 AN	ursday, 28-12-2019 / To 12:00 PM		Max. Marks:	: 50
Instr	uctior	1 <b>s:</b> 1 2 3	<ul> <li>) Q. No. 1 is compulsory and sho answer book.</li> <li>) Answer MCQ Objective type q</li> <li>) Figures to right indicate full ma</li> </ul>	ould b uestic arks.	e solved in first 20 minutes in ons on Page No. 3 only	
			MCQ/Objective Ty	/pe (	Questions	
Dura	tion: 2	0 Mi	nutes		Marks	: 10
Q.1	Choo sente	ose i ence	the correct alternatives from th e.	e opt	tions and rewrite the	10
	1)	To a) c)	read the control words sequentia PC uPC	lly b) d)	is used. IR None of these	
	2)	Dat but a) c)	ta used with assembly language i  Opcode Register	nstru b) d)	ction in processors are nothing Operand None of these	
	3)	In F a) c)	Processor DMA Stand for Direct Memory Access Direct mapping Access	b) d)	Division Memory Access All of the above	
	4)	Wh a) c)	at is not true about RISC? Large no of addressing modes Hardwired control unit	b) d)	Simple instruction A single chip processor	
	5)	To req a) c)	interface 2048 bytes of memory, uired? 8 10	how ı b) d)	many address lines are 9 11	
	6)	The a) c)	e addressing mode, where operat Immediate Definite	nd va b) d)	lue is directly specified is called Direct Relative	·
	7)	Wh a) c)	ich representation is most efficier Sign magnitude 2's complements	nt to p b) d)	perform arithmetic operations? 1's complements None of these	
	8)	Wh pro a) c)	ich register points to the first inst cessor starts. Accumulator Data register	ructio b) d)	n to be executed when the Program counter Instruction register	
	9)	Spe a) c)	eedup techniques of computer ind cache superscalar	clude b) d)	 pipeline all of these	

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** COMPUTER ORGANIZATION

Seat No.

**SLR-FM-255** 

Q

Set



- Floating point representation consist of \_\_\_\_\_. a) Mantissa b) expo 10)

  - c) Both a) and b)

- b) exponentd) none of th none of these

Set

### Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40

40

Q

		Electronics & Telecommunication Engineering COMPUTER ORGANIZATION	
Day o Time	& Date : 10:0	Thursday, 28-12-2019 Max. Marks: 5	50
Instr	uctior	<ol> <li>Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.</li> <li>Answer MCQ Objective type questions on Page No. 3 only</li> <li>Figures to right indicate full marks.</li> </ol>	
		MCQ/Objective Type Questions	
Dura	tion: 2	Minutes Marks: 7	10
Q.1	Choo sento 1)	e the correct alternatives from the options and rewrite the ce. /hat is not true about RISC? ) Large no of addressing modes b) Simple instruction ) Hardwired control unit d) A single chip processor	<b>0</b>
	2)	o interface 2048 bytes of memory, how many address lines are equired? ) 8 b) 9 ) 10 d) 11	
	3)	he addressing mode, where operand value is directly specified is called ) Immediate b) Direct ) Definite d) Relative	
	4)	/hich representation is most efficient to perform arithmetic operations?) Sign magnitudeb)1's complements) 2's complementsd)None of these	
	5)	<ul> <li>/hich register points to the first instruction to be executed when the rocessor starts.</li> <li>Accumulator</li> <li>Data register</li> <li>Data register</li> </ul>	
	6)	peedup techniques of computer include ) cache b) pipeline ) superscalar d) all of these	
	7)	loating point representation consist of ) Mantissa b) exponent ) Both a) and b) d) none of these	
	8)	o read the control words sequentially is used. ) PC b) IR ) uPC d) None of these	
	9)	ata used with assembly language instruction in processors are nothing	

Seat		
No		

NO.

- but
  - a) Opcode c) Register
- Operand b)
  - None of these d)

- 50
- T.E. (Part II) (Old) (CGPA) Examination Nov/Dec-2019



- 10)In Processor DMA Stand for \_\_\_\_\_.a)Direct Memory Accessb)c)Direct mapping Accessd)
- Division Memory Access All of the above

Seat	
No.	

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40



Seat	
No.	

Q.1

4)

#### **Electronics & Telecommunication Engineering COMPUTER ORGANIZATION** Day & Date: Thursday, 28-12-2019 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) Answer MCQ Objective type questions on Page No. 3 only 3) Figures to right indicate full marks. MCQ/Objective Type Questions **Duration: 20 Minutes** Marks: 10 Choose the correct alternatives from the options and rewrite the sentence.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

- Which register points to the first instruction to be executed when the 1) processor starts.
  - a) Accumulator b) Program counter Instruction register d)
  - c) Data register
- 2) Speedup techniques of computer include \_
  - a) cache pipeline b) c) superscalar d) all of these
- 3) Floating point representation consist of
  - a) Mantissa exponent b) c) Both a) and b) d) none of these
  - To read the control words sequentially \_
  - is used. a) PC b) IR
    - c) uPC d) None of these
- Data used with assembly language instruction in processors are nothing 5) but
  - a) Opcode b) Operand d) None of these c) Register
- In Processor DMA Stand for \_\_\_\_\_ 6)
  - a) Direct Memory Access **Division Memory Access** b)
  - c) Direct mapping Access All of the above d)
- 7) What is not true about RISC?
  - a) Large no of addressing modes b) Simple instruction A single chip processor
  - c) Hardwired control unit d)
- 8) To interface 2048 bytes of memory, how many address lines are required?
  - a) 8 9 b)
  - d) 11 c) 10
- 9) The addressing mode, where operand value is directly specified is called \_\_\_\_\_.
  - Immediate Direct a) b) Definite d) c)
    - Relative

Max. Marks: 50

10

Set



- Which representation is most efficient to perform arithmetic operations?a) Sign magnitudeb)c) 2's complementsd)None of these 10)

Set

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 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 (each 10 marks)

- a) Write note Virtual memory system.
- **b)** Explain instruction set formats in detail.
- c) Explain CISC and RISC Architecture in detail.
- d) Explain GCD processor hardwired control unit.
- e) Explain memory allocation schemes in details.
- f) Explain in detail cache memory organization.

Max. Marks: 40

40

S

### Seat No.

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPERATING SYSTEM**

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

Marks: 10

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) Process is
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 2) The strategy of allowing processes that are logically runnable to be temporarily suspended is called .
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served
- 3) A non-relocatable program is one which \_\_\_\_\_.
  - a) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.
  - consists of a program and relevant information for its relocation. b)
  - can itself performs the relocation of its address-sensitive portions. c)
  - d) all of the above
- 4) Operating system
  - links a program with the subroutines it references a)
  - b) provides a layered, user-friendly interface
  - c) enables the programmer to draw a flowchart
  - d) all of the above
- Which of the following is not true about the memory management? 5)
  - a) virtual memory is used only in multi-user systems
  - b) segmentation suffers from external fragmentation
  - paging suffers from internal fragmentation c)
  - d) segmented memory can be paged
- Which of the following is characteristic of an operating system? 6)
  - a) resource management
  - c) memory management
- error recovery b)
- All the above d)
- A thread is a \_\_\_\_\_. 7)
  - a) Task
  - Program c)

Max. Marks: 50

- Process b)
- d) Light weight process

Set





- In \_\_\_\_\_\_ the processes under consideration must be independent: that is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention
- b) deadlock avoidance
- c) deadlock detection
- d) deadlock deletion
- 9) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - a) memory partitioning
- b) virtual memory
- c) real memory d) memory organization
- 10) To access the services of operating system, the interface is provided by the \_\_\_\_\_.
  - a) System calls
  - c) library

b) APId) Assembly instructions

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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

Seat

No.

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### **Q.2** Attempt any four of the following questions.

- a) Why we need the operating system? Explain following types of operating system
  - 1) Time sharing system
  - 2) Real time system
- **b)** What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- **d)** What are necessary conditions for deadlock situation? Explain resource allocation graph with dead lock.
- e) Discuss in detail paging as memory management scheme.





Max. Marks: 40

# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**OPERATING SYSTEM** 

**Duration: 20 Minutes** 

2)

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

b)

d)

- 1) Which of the following is characteristic of an operating system? error recovery
  - a) resource management
  - c) memory management

A thread is a .

a) Task

c) Program

- b) Process
- d) Light weight process
- the processes under consideration must be independent: that 3) In is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention c) deadlock detection
- b) deadlock avoidance d) deadlock deletion

Assembly instructions

- 4) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - memory partitioning a) b) virtual memory
  - c) real memory d) memory organization
- 5) To access the services of operating system, the interface is provided by the . API
  - a) System calls b) c) library d)
- 6) Process is \_\_\_\_\_
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 7) The strategy of allowing processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_.
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served

Max. Marks: 50





All the above

Marks: 10

#### 8) A non-relocatable program is one which \_\_\_\_\_.

a) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.

**SLR-FM-256** 

Set

- b) consists of a program and relevant information for its relocation.
- c) can itself performs the relocation of its address-sensitive portions.
- d) all of the above
- 9) Operating system \_\_\_\_
  - a) links a program with the subroutines it references
  - b) provides a layered, user-friendly interface
  - c) enables the programmer to draw a flowchart
  - d) all of the above
- 10) Which of the following is not true about the memory management?
  - a) virtual memory is used only in multi-user systems
  - b) segmentation suffers from external fragmentation
  - c) paging suffers from internal fragmentation
  - d) segmented memory can be paged

### Page **6** of **12**

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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

Seat

No.

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Q.2 Attempt any four of the following questions.

- a) Why we need the operating system? Explain following types of operating system
  - 1) Time sharing system
  - 2) Real time system
- **b)** What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- **d)** What are necessary conditions for deadlock situation? Explain resource allocation graph with dead lock.
- e) Discuss in detail paging as memory management scheme.





40

Max. Marks: 40

### Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPERATING SYSTEM**

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

3)

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - memory partitioning a)
- b) virtual memory
- c) real memory d) memory organization 2) To access the services of operating system, the interface is provided by

d)

- the
- System calls b) API a) Assembly instructions
- c) library
- Process is
- a) program in High level language kept on disk
- b) contents of main memory
- c) a program in execution
- d) a job in secondary memory
- 4) The strategy of allowing processes that are logically runnable to be temporarily suspended is called .
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served
- A non-relocatable program is one which 5)
  - a) cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.
  - consists of a program and relevant information for its relocation. b)
  - can itself performs the relocation of its address-sensitive portions. c)
  - d) all of the above
- 6) Operating system
  - a) links a program with the subroutines it references
  - b) provides a layered, user-friendly interface
  - c) enables the programmer to draw a flowchart
  - d) all of the above

Max. Marks: 50

Marks: 10

Set

R

#### 7) Which of the following is not true about the memory management?

- a) virtual memory is used only in multi-user systems
- b) segmentation suffers from external fragmentation
- c) paging suffers from internal fragmentation
- d) segmented memory can be paged

#### 8) Which of the following is characteristic of an operating system?

- a) resource management
- error recovery b)
- c) memory management
- d) All the above

**SLR-FM-256** 

Set R

- 9) A thread is a \_\_\_\_\_. a) Task
- b) Process
- c) Program d) Light weight process
- In \_\_\_\_\_ the processes under consideration must be independent: that 10) is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention
  - c) deadlock detection
- b) deadlock avoidance
- deadlock deletion d)

40

# T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

**OPERATING SYSTEM** 

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

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Q.2 Attempt any four of the following questions.

- Why we need the operating system? Explain following types of operating a) system
  - 1) Time sharing system
  - Real time system 2)
- b) What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- What are necessary conditions for deadlock situation? Explain resource d) allocation graph with dead lock.
- Discuss in detail paging as memory management scheme. e)

# Set

Max. Marks: 40

Seat No.

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering OPERATING SYSTEM**

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 the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

Marks: 10

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10

- 1) A non-relocatable program is one which
  - cannot be made to execute in any area of storage other than the one a) designated for it at the time of its coding or translation.
  - consists of a program and relevant information for its relocation. b)
  - can itself performs the relocation of its address-sensitive portions. c)
  - d) all of the above

#### 2) Operating system

- a) links a program with the subroutines it references
- b) provides a layered, user-friendly interface
- c) enables the programmer to draw a flowchart
- d) all of the above
- 3) Which of the following is not true about the memory management?
  - a) virtual memory is used only in multi-user systems
  - b) segmentation suffers from external fragmentation
  - paging suffers from internal fragmentation c)
  - d) segmented memory can be paged
- 4) Which of the following is characteristic of an operating system?
  - resource management a)
  - memory management C)
- 5) A thread is a \_\_\_\_\_.

Program

Task a)

c)

b) Process

b)

d)

Light weight process d)

deadlock avoidance

- In the processes under consideration must be independent: that 6) is, the order in which they execute must be unconstrained by any synchronization requirements.
  - a) deadlock prevention
  - b) c) deadlock detection d) deadlock deletion
- 7) In almost all modern multi programming systems, principal operation of memory management involves a sophisticated scheme known as
  - memory partitioning a)
  - real memory C)

- virtual memory b)
- d) memory organization



Set

Max. Marks: 50

error recoverv All the above



- To access the services of operating system, the interface is provided by the \_\_\_\_\_.
  - a) System callsc) library

- b) API
- d) Assembly instructions

- 9) Process is \_\_\_\_\_.
  - a) program in High level language kept on disk
  - b) contents of main memory
  - c) a program in execution
  - d) a job in secondary memory
- 10) The strategy of allowing processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_.
  - a) preemptive scheduling
  - b) non preemptive scheduling
  - c) Shortest job first
  - d) first come first served

### Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering OPERATING SYSTEM

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

**Instructions:** 1) All the questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Q.2 Attempt any four of the following questions.

- a) Why we need the operating system? Explain following types of operating system
  - 1) Time sharing system
  - 2) Real time system
- **b)** What do you mean by process in operating system? List different process States and explain it with the help of diagram of process state transitions.
- c) Draw and explain queuing diagram representation of process scheduling, what is the difference between long term scheduler and short term scheduler?
- **d)** What are necessary conditions for deadlock situation? Explain resource allocation graph with dead lock.
- e) Discuss in detail paging as memory management scheme.



**SLR-FM-256** 

Max. Marks: 40

Seat No.

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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

Instructions: 1) Q. No. 7	1 is compulsory and should be solved in first 20 minutes in and	swer
Book.		

2) Figures to the 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) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor Motion sensor b)
  - c) Action sensor d) Touch sensor
- The common robotic arm has \_\_\_\_\_ degrees of freedom. 2)
  - Five a) Six b)
  - c) Four d) Three
- The process of extracting, characterizing and interpreting information from 3) images of 3 D world is referred as \_
  - b) Robochar a) Robot vision
  - Robo 3D c) d) Roboextract
- 4) Robotic vehicles are used in
  - a) Remotely operated communication systems
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above

#### Programming of a robot can be done by \_ 5)

- a) Force sensors Teach pendant programming b)
- c) Tactile sensors d) **Touch sensors**
- The main objective(s) of Industrial robot is to \_\_\_\_\_. 6)
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above
- 7) The following sensor can detect nearby objects \_\_\_\_\_
  - Touch sensor Humidity sensor b) a) C)
    - Proximity sensor d) Pressure sensor

#### 8) A robot is a \_\_\_\_

- a) multifunctional and reprogrammable manipulator
- b) unifunctional and reprogrammable manipulator
- c) multifunctional and non-programmable manipulator
- unifunctional and non-programmable manipulator d)

Max. Marks: 50

Marks: 10

Set

- \_\_\_\_\_ can be used to measure the distance from a reference to the 9) object in the field.
  - a) Force sensor

b) Pressure sensor

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Set P

- c) Range sensor d)
- Torque sensor
- The speed regulation is good in \_\_\_\_\_. a) Series wound motor 10)

  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

#### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Max. Marks: 40

40

Set

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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 the right indicate full marks.

### MCQ/Objective Type Questions

**Duration: 20 Minutes** 

Seat No.

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10 1)

- The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above
- 2) The following sensor can detect nearby objects \_\_\_\_\_
  - Touch sensor b) Humidity sensor a) Pressure sensor
    - Proximity sensor d) C)
- 3) A robot is a
  - a) multifunctional and reprogrammable manipulator
  - b) unifunctional and reprogrammable manipulator
  - c) multifunctional and non-programmable manipulator
  - d) unifunctional and non-programmable manipulator
- 4) can be used to measure the distance from a reference to the object in the field.
  - a) Force sensor

c) Range sensor

- b) Pressure sensor d) Torque sensor
- The speed regulation is good in \_\_\_\_\_. 5)
  - a) Series wound motor
  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above
- 6) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor Motion sensor b)
  - c) Action sensor d) Touch sensor
- The common robotic arm has \_\_\_\_\_ degrees of freedom. 7)
  - a) Six b) Five
  - c) Four Three d)
- The process of extracting, characterizing and interpreting information from 8) images of 3 D world is referred as \_
  - a) Robot vision b) Robochar
  - c) Robo 3D d) Roboextract



Max. Marks: 50

Marks: 10

SLR-FM-257 Set Q

- 9) Robotic vehicles are used in \_\_\_\_\_.
  - a) Remotely operated communication systems
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above
- 10) Programming of a robot can be done by \_\_\_\_
  - a) Force sensors
- - d) To
- c) Tactile sensors
- by \_\_\_\_\_.b) Teach pendant programmingd) Touch sensors

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

#### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Set Q

Max. Marks: 40

#### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ROBOTICS

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 the right indicate full marks.

### 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

b)

Pressure sensor

- \_\_\_\_\_ can be used to measure the distance from a reference to the 1) object in the field.
  - a) Force sensor
  - c) Range sensor d) Torque sensor
- 2) The speed regulation is good in \_\_\_\_\_.
  - a) Series wound motor
  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above
- 3) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor b) Motion sensor Touch sensor
  - c) Action sensor d)
- 4) The common robotic arm has \_\_\_\_\_ degrees of freedom.
  - b) Five
  - c) Four d) Three
- The process of extracting, characterizing and interpreting information from 5) images of 3 D world is referred as
  - Robochar a) Robot vision b)
  - c) Robo 3D d) Roboextract
- 6) Robotic vehicles are used in
  - a) Remotely operated communication systems
  - b) Space vehicles

a) Six

- c) Undersea exploration
- d) All of the above

#### Programming of a robot can be done by \_ 7)

- a) Force sensors Teach pendant programming b) c) Tactile sensors
  - Touch sensors d)
- 8) The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above

Set R

Max. Marks: 50



- 9) The following sensor can detect nearby objects \_\_\_\_\_.
  - a) Touch sensor

- b) Humidity sensor
- c) Proximity sensor
- d) Pressure sensor

- 10) A robot is a \_\_\_\_\_.
  - a) multifunctional and reprogrammable manipulator
  - b) unifunctional and reprogrammable manipulator
  - c) multifunctional and non-programmable manipulator
  - d) unifunctional and non-programmable manipulator

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

#### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Set R

Max. Marks: 40

# Set S

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

### MCQ/Objective Type Questions

Duration: 20 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10
  - 1) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as \_\_\_\_\_.
    - a) Robot vision

c) Robo 3D

- b) Robochar d) Roboextract
- 2) Robotic vehicles are used in \_\_\_\_\_
  - a) Remotely operated communication systems
  - b) Space vehicles
  - c) Undersea exploration
  - d) All of the above

#### 3) Programming of a robot can be done by \_\_\_\_\_

- a) Force sensors b) Teach pendant programming
- c) Tactile sensors d) Touch sensors
- 4) The main objective(s) of Industrial robot is to \_\_\_\_\_.
  - a) To minimise the labour requirement
  - b) To increase productivity
  - c) To enhance the life of production machines
  - d) All of the above
- 5) The following sensor can detect nearby objects \_\_\_\_\_
  - a) Touch sensor b) Humidity sensor
  - c) Proximity sensor d) Pressure sensor
- 6) A robot is a \_\_\_\_
  - a) multifunctional and reprogrammable manipulator
  - b) unifunctional and reprogrammable manipulator
  - c) multifunctional and non-programmable manipulator
  - d) unifunctional and non-programmable manipulator
- 7) \_\_\_\_\_ can be used to measure the distance from a reference to the object in the field.
  - a) Force sensor
- b) Pressure sensord) Torque sensor
- c) Range sensor d)
- 8) The speed regulation is good in \_\_\_\_\_.
  - a) Series wound motor
  - b) Shunt wound motor
  - c) Can be series wound or shunt wound.
  - d) None of the above

Max. Marks: 50

Marks: 10

#### Which of the following is a sensor that measures the movement of an 9) object?

- a) Pressure sensor
- b) Motion sensor

**SLR-FM-257** 

Set S

- Touch sensor c) Action sensor d)
- The common robotic arm has \_\_\_\_\_ degrees of freedom. 10)
  - a) Six b) Five d)
  - c) Four

Three

Seat	
No.	

### T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ROBOTICS

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 the right indicate full marks.

#### Q.2 Attempt any four of the following:

- a) Explain motion control of robots.
- **b)** Explain robotic applications.
- c) Explain the following terms related to robotics :
  - 1) Accuracy
  - 2) Precision
  - 3) Resolution
  - 4) Repeatability
  - 5) Speed
- d) Explain in brief about types of sensors.
- e) Explain Microelectromechanical systems and write in brief about classification of MEMS.
- f) What is machine Intelligence? Explain Computer and robotics Future trends.
- g) Explain electrical drives for robotic articulation.



Max. Marks: 40
			INICQ/Objective	гуре	Questions	
Dura	ation: 3	30 M	inutes		Mark	s
Q.1	<b>Cho</b> 1)	o <b>se</b> Nur a) c)	the correct alternatives from nber of links to connect n node N(N-1)/2 N	<b>the o</b> s in a b) d)	ptions and rewrite the sentence. mesh topology is = N(N-2) N2	
	2)	Wh a) c)	ich is the central device in star STP server PDC	topolo b) d)	ogy? Hub Router	
	3)	The of th a) c)	e process-to-process delivery o ne layer. Transport Physical	f the e b) d)	ntire message is the responsibility Application Network	
	4)	HDI a) b) c) d)	LC is an acronym for Half-duplex digital link combir Host double-level circuit High-duplex line communicati High-level data link control	nation Ion		
	5)	The a) c)	e hamming distance between da 3 2	atawo b) d)	rd, 110101 and 100010 is 4 1	
	6)	Urg a) c)	ent data requires the urgent po field. Control Sequence number	binter f b) d)	ield as well as the URG bit in the Offset None	
	7)	To a a) c)	accomplish flow control, TCP u limited-size fixed-size	ses a b) d)	window protocol. Sliding None	

An ACK segment, if carrying no data, consumes sequence number(s).

b)

b) 4

d) 8

Two

d) Sixteen bit

\_ bytes.

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK** 

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.

### MCO/Objective Type Ouestiens

No.

Seat

8)

9)

One

NO

6

32

The Ethernet address of system is of \_\_\_\_\_

a)

c)

a)

C)

## **SLR-FM-258**

Max. Marks: 70

Set

Marks: 14

- Set P
- The bridge is suitable at \_\_\_\_\_ layer of OSI reference model. 10) Application
  - b) Transport
  - a) Data-link c) d) Network
- 11) \_\_\_\_ is a Network device, used for repackage and convert data going from one environment to another.
  - a) Router b) Gateway
  - d) Switch c) Repeater
- 12) The formal protocol that defines the MTA client and server in the Internet is called .
  - Systematic mail transfer protocol a)
  - Simple mail transfer protocol b)
  - DHCP c)

a)

- d) None of the above
- 13) \_ provide both static and dynamic address allocation which can be manual / automated.
  - SMTP b) DHCP
  - TELNET ICMP C) d)
- The length of IPv6 is \_\_\_\_\_ bits. 14)
  - a) 32 b) 64 C) 128 d) 16

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any three.

Seat

No.

- a) Explain the bit stuffing method of framing with suitable example.
- b) If message to be transmitted is 1101011011 and  $G(x) = X^4 + X + 1$ . What is the transmitted bit pattern according to CRC?
- c) What is layered architecture? Draw OSI model with function of each layer in brief.
- d) Explain different classes of IP addresses along with their address ranges.

#### Q.3 Solve Any two.

- a) What is subnet masking? Explain with suitable example. If a router inside an organization receives some packet with destination address 190.240.33.91/19 find the subnet work address to route the packet.
- b) Draw TCP header format and explain each field.
- c) Write a note on.
  - 1) Star Topology
  - 2) Stop and wait protocol

#### Section – II

#### Q.4 Solve any three.

- a) Write a short note on IEEE 802.4.
- **b)** Explain shortest path routing with an example.
- c) What are Gateways? Explain its function.
- d) Write a short note on IPv6.

#### Q.5 Solve any two.

- a) Explain ICMP along with its any 4 different message types.
- **b)** Write a note on.
  - 1) Repeaters
    - 2) Routers
- c) What is Internet Domain Name System? Explain domain name space and domain name sections.

SLR-FM-258

Set

Max. Marks: 56

16

12

16

Seat No.

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory	and should be	e solved in first 3	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

- An ACK segment, if carrying no data, consumes sequence number(s). 1)
  - One a)
    - c) NO d) Sixteen bit
- 2) The Ethernet address of system is of \_\_\_\_\_ bytes.
  - b) 4 a) 6
  - c) 32 d) 8
- The bridge is suitable at \_\_\_\_\_ layer of OSI reference model. 3)
  - a) Application b) Transport c) Data-link d) Network
- 4) is a Network device, used for repackage and convert data going from one environment to another.
  - a) Router b) Gateway
  - Repeater d) Switch c)
- The formal protocol that defines the MTA client and server in the Internet 5) is called
  - Systematic mail transfer protocol a)
  - Simple mail transfer protocol b)
  - DHCP c)
  - d) None of the above
- \_ provide both static and dynamic address allocation which can be 6) manual / automated.
  - SMTP DHCP a) b) TELNET ICMP c) d)
- The length of IPv6 is \_\_\_\_\_ bits. 7)
  - 32 b) 64 a) C) 128 d) 16

Number of links to connect n nodes in a mesh topology is =\_\_\_\_\_. 8)

- N(N-1)/2 b) N(N-2) a) Ν d) N2 c)
- Which is the central device in star topology? 9)
  - b) Hub STP server a) c) PDC
    - d) Router

Set

Marks: 14

b) Two





Set Q

- 10) The process-to-process delivery of the entire message is the responsibility of the \_\_\_\_\_ layer.
  - a) Transport

b) Application

c) Physical

- d) Network
- 11) HDLC is an acronym for \_\_\_\_\_.
  - a) Half-duplex digital link combination
  - b) Host double-level circuit
  - c) High-duplex line communication
  - d) High-level data link control
- 12) The hamming distance between dataword, 110101 and 100010 is \_\_\_\_\_.
  - a) 3 b) 4
  - c) 2 d) 1
- 13) Urgent data requires the urgent pointer field as well as the URG bit in the \_\_\_\_\_\_ field.
  - a) Control b) Offset
  - c) Sequence number d) None
- 14) To accomplish flow control, TCP uses a \_\_\_\_\_ window protocol.
  - a) limited-size

C)

fixed-size

- b) Sliding
- d) None

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any three.

Seat

No.

- a) Explain the bit stuffing method of framing with suitable example.
- b) If message to be transmitted is 1101011011 and  $G(x) = X^4 + X + 1$ . What is the transmitted bit pattern according to CRC?
- c) What is layered architecture? Draw OSI model with function of each layer in brief.
- d) Explain different classes of IP addresses along with their address ranges.

#### Q.3 Solve Any two.

- a) What is subnet masking? Explain with suitable example. If a router inside an organization receives some packet with destination address 190.240.33.91/19 find the subnet work address to route the packet.
- b) Draw TCP header format and explain each field.
- **c)** Write a note on.
  - 1) Star Topology
  - 2) Stop and wait protocol

#### Section – II

#### Q.4 Solve any three.

- a) Write a short note on IEEE 802.4.
- **b)** Explain shortest path routing with an example.
- c) What are Gateways? Explain its function.
- d) Write a short note on IPv6.

#### Q.5 Solve any two.

- a) Explain ICMP along with its any 4 different message types.
- **b)** Write a note on.
  - 1) Repeaters
    - 2) Routers
- c) What is Internet Domain Name System? Explain domain name space and domain name sections.

## SLR-FM-258

Set

Max. Marks: 56

16

12

16

			MCQ/Objective	Туре	Questions	
Dura	tion: (	30 Mi	nutes		Marks: 1	4
Q.1	<b>Cho</b> 1)	o <b>se t</b> The a) c)	t <b>he correct alternatives from</b> hamming distance between d 3 2	t <b>he o</b> atawor b) d)	ptions and rewrite the sentence. 1 rd, 110101 and 100010 is 4 1	4
	2)	Urge a) c)	ent data requires the urgent po field. Control Sequence number	binter f b) d)	ield as well as the URG bit in the Offset None	
	3)	To a a) c)	accomplish flow control, TCP ເ limited-size fixed-size	uses a b) d)	window protocol. Sliding None	
	4)	An A a) c)	ACK segment, if carrying no da One NO	ata, co b) d)	nsumes sequence number(s). Two Sixteen bit	
	5)	The a) c)	Ethernet address of system is 6 32	s of b) d)	bytes. 4 8	
	6)	The a) c)	bridge is suitable at la Application Data-link	ayer of b) d)	OSI reference model. Transport Network	
	7)	from a) c)	is a Network device, used for one environment to another. Router Repeater	or repa b) d)	ackage and convert data going Gateway Switch	
	8)	The is ca a) b) c) d)	formal protocol that defines the alled Systematic mail transfer protocol Simple mail transfer protocol DHCP None of the above	ne MTA ocol	A client and server in the Internet	
	9)	mar a)	provide both static and dy nual / automated.	namic b)	address allocation which can be	

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.

Seat

Day & Date: Saturday, 07-12-2019

Time: 02:30 PM To 05:30 PM

No.

### B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK**

Max. Marks: 70

Set R

d) ICMP TELNET C)

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Set R

- The length of IPv6 is \_\_\_\_\_ bits. 10)
  - 32 a)

a)

- b) 64 C) 128 d) 16
- 11) Number of links to connect n nodes in a mesh topology is =\_\_\_\_\_.
  - N(N-1)/2 b) N(N-2)
  - Ν c)
- 12) Which is the central device in star topology?
  - a) STP server b) Hub
  - PDC C) d) Router
- 13) The process-to-process delivery of the entire message is the responsibility of the \_\_\_\_\_ layer.
  - Transport a)
  - C) Physical

b) Application d) Network

d) N2

- 14) HDLC is an acronym for \_\_\_\_\_
  - a) Half-duplex digital link combination
  - Host double-level circuit b)
  - High-duplex line communication c)
  - d) High-level data link control

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any three.

Seat

No.

- a) Explain the bit stuffing method of framing with suitable example.
- b) If message to be transmitted is 1101011011 and  $G(x) = X^4 + X + 1$ . What is the transmitted bit pattern according to CRC?
- c) What is layered architecture? Draw OSI model with function of each layer in brief.
- d) Explain different classes of IP addresses along with their address ranges.

#### Q.3 Solve Any two.

- a) What is subnet masking? Explain with suitable example. If a router inside an organization receives some packet with destination address 190.240.33.91/19 find the subnet work address to route the packet.
- b) Draw TCP header format and explain each field.
- c) Write a note on.
  - 1) Star Topology
  - 2) Stop and wait protocol

#### Section – II

#### Q.4 Solve any three.

- a) Write a short note on IEEE 802.4.
- **b)** Explain shortest path routing with an example.
- c) What are Gateways? Explain its function.
- d) Write a short note on IPv6.

#### Q.5 Solve any two.

- a) Explain ICMP along with its any 4 different message types.
- **b)** Write a note on.
  - 1) Repeaters
    - 2) Routers
- c) What is Internet Domain Name System? Explain domain name space and domain name sections.

SLR-FM-258

Set

Max. Marks: 56

16

12

16

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

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.

#### **MCQ/Objective Type Questions**

Duration: 30 Minutes

Seat

No.

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

- 1) The bridge is suitable at \_\_\_\_\_ layer of OSI reference model.
  - a) Application b) Transport c) Data-link d) Network
- \_\_\_\_\_ is a Network device, used for repackage and convert data going from one environment to another.
  - a) Router b) Gateway
  - c) Repeater d) Switch
- 3) The formal protocol that defines the MTA client and server in the Internet is called \_\_\_\_\_.
  - a) Systematic mail transfer protocol
  - b) Simple mail transfer protocol
  - c) DHCP

5)

d) None of the above

N(N-1)/2

a)

- 4) \_\_\_\_\_ provide both static and dynamic address allocation which can be manual / automated.
  - a) SMTP b) DHCP c) TELNET d) ICMP
  - The length of IPv6 is \_\_\_\_\_ bits.
    - a) 32 b) 64 c) 128 d) 16

6) Number of links to connect n nodes in a mesh topology is =\_\_\_\_\_.

b) N(N-2)

- c) N d) N2
- 7) Which is the central device in star topology?
  - a) STP server b) Hub
  - c) PDC d) Router
- The process-to-process delivery of the entire message is the responsibility of the \_\_\_\_\_ layer.
  - a) Transport b) Application
  - c) Physical d) Network



Max. Marks: 70

Marks: 14

Set S

9)	<ul> <li>HDLC is an acronym for</li> <li>a) Half-duplex digital link combine</li> <li>b) Host double-level circuit</li> <li>c) High-duplex line communication</li> <li>d) High-level data link control</li> </ul>	nation
10)	The hamming distance between da a) 3 c) 2	ataword, 110101 and 100010 is b) 4 d) 1
11)	Urgent data requires the urgent po field. a) Control c) Sequence number	inter field as well as the URG bit in the b) Offset d) None
12)	To accomplish flow control, TCP us a) limited-size c) fixed-size	ses a window protocol. b) Sliding d) None
13)	An ACK segment, if carrying no da a) One c) NO	ta, consumes sequence number(s). b) Two d) Sixteen bit
14)	The Ethernet address of system is a) 6 c) 32	of bytes. b) 4 d) 8

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any three.

Seat

No.

- a) Explain the bit stuffing method of framing with suitable example.
- b) If message to be transmitted is 1101011011 and  $G(x) = X^4 + X + 1$ . What is the transmitted bit pattern according to CRC?
- c) What is layered architecture? Draw OSI model with function of each layer in brief.
- d) Explain different classes of IP addresses along with their address ranges.

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- a) What is subnet masking? Explain with suitable example. If a router inside an organization receives some packet with destination address 190.240.33.91/19 find the subnet work address to route the packet.
- b) Draw TCP header format and explain each field.
- **c)** Write a note on.
  - 1) Star Topology
  - 2) Stop and wait protocol

#### Section – II

#### Q.4 Solve any three.

- a) Write a short note on IEEE 802.4.
- **b)** Explain shortest path routing with an example.
- c) What are Gateways? Explain its function.
- d) Write a short note on IPv6.

#### Q.5 Solve any two.

- a) Explain ICMP along with its any 4 different message types.
- **b)** Write a note on.
  - 1) Repeaters
    - 2) Routers
- c) What is Internet Domain Name System? Explain domain name space and domain name sections.

## SLR-FM-258

Set S

Max. Marks: 56

16

12

16

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** EMBEDDED SYSTEM DESIGN Day & Date: Tuesday, 10-12-2019 Max. Marks: 70 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 suitable data if necessary. **MCQ/Objective Type Questions** Marks: 14

**Duration: 30 Minutes** 

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

- LPC2148 has \_\_\_\_\_ on chip flash program memory. 1)
  - a) 32 KB b) 64 KB 8 KB 16 KB C) d)
- Total number of available ADC inputs for LPC 2148 is \_\_\_\_\_. 2)
  - a) 06 b) 08 14 c) 12 d)

3) In I<sup>2</sup>c standard mode, speed is given as

- 200 kbps 400 kbps a) b)
- None of above 100 kbps d) c)
- ARM 7 Architecture support total \_ 4) interrupt sources.
  - 20 b) 30 a) c) 32 d) 10
- 5) Inter-task or inter process communication in  $\mu cos$  II RTOS takes place using
  - Semaphore a) b) Message mailbox c) Message queues d) All
- software is the part of kernel responsible for determining which 6) task will run next.
  - Scheduler b) Semaphore a) Mailbox d) Mutex C)
- SWAP instruction in the instruction set of ARM processor is a special case 7) of \_\_\_\_\_ instruction.
  - a) Arithmetic b) Logical
    - C) Load-Store d) Branch
- Exception priorities are in the following descending order \_\_\_\_\_ 8)
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet a)
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet b)
  - Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet c)
  - Not in fixed order d)

Seat No.

**SLR-FM-259** 

Set

- 9) Which of the following VIC having the highest priority?
  - Vectored interrupt request a)
  - Fast interrupt request c)
- 10) A thread is a \_\_\_\_\_ process.
  - a) Multi process
  - Light weight C)
- Round robin scheduling 11)
  - Allows interactive task quicker access to processor a)
  - Is quite complex to implement b)
  - Gives each task the same chance at the processor c)
  - None of above d)

#### 12) The FIFO algorithm

- a) Execute first the job that last entered the queue
- Execute first the job that first entered the queue b)
- c) Execute first the job that has been in the queue the longest
- d) None of above
- Inter process can be done through \_\_ 13)
  - Mails a)
  - System calls c)
- 14) A binary semaphore \_\_\_\_\_.
  - has value one or zero a)
  - is used for synchronization C)

b) Inter thread process

None of the above

Non vectored interrupt request

None of above d)

b)

d)

**SLR-FM-259** 

#### b) Messages d) Trap

- b) is essential to binary commuter
- is used for mutual exclusion d)



## B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Day & Date: Tuesday, 10-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

#### Section – I

EMBEDDED SYSTEM DESIGN

#### Q.2 Solve any Four.

Seat

No.

- a) Draw & explain Hardware architecture of embedded system.
- b) What are the different applications of embedded system?
- c) Write the features of LPC 2148.
- d) Explain with code Interfacing of Relay to LPC 2148 in detail.
- e) Explain the communication protocol I<sup>2</sup>C details.

#### Q.3 Solve any Two.

- a) Draw ARM core architecture & explain each block of ARM core architecture in detail.
- **b)** Explain the following on chip peripherals of ARM 2148 in detail. RTC, WDT, PLL
- c) Explain the communication protocol USB in details.

#### Section – II

#### Q.4 Solve any Four.

- a) What are the features of  $\mu cos$  II RTOS?
- **b)** What is task scheduling? Explain various task scheduling algorithms.
- c) Explain with code Interfacing of LED for LPC 2148 in detail.
- d) Explain the concept of Semaphores with example.
- e) Explain Round Robin architecture. States its advantages and disadvantage.

#### Q.5 Solve any Two.

- a) Write a short note on.
  - 1) Massage queues and mailboxes
  - 2) Pipes
- b) Explain in detail with neat diagrams Mobile Phones.
- c) Explain with code Interfacing of DAC to LPC 2148 in detail.

SLR-FM-259



Max. Marks: 56

16

12

16

Seat	
No.	

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** EMBEDDED SYSTEM DESIGN

Day & Date: Tuesday, 10-12-2019 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 suitable data if necessary.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

3)

a)

a)

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

- 1) Exception priorities are in the following descending order
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet a)
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet b)
  - Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet c)
  - Not in fixed order d)
- 2) Which of the following VIC having the highest priority?
  - Vectored interrupt request a)
  - Fast interrupt request c) A thread is a \_\_\_\_\_ process.
- Inter thread process b)
- Light weight C)
- 4) Round robin scheduling \_

Multi process

- Allows interactive task quicker access to processor a)
- Is guite complex to implement b)
- Gives each task the same chance at the processor c)
- d) None of above
- 5) The FIFO algorithm
  - Execute first the job that last entered the queue a)
  - Execute first the job that first entered the queue b)
  - c) Execute first the job that has been in the queue the longest
  - None of above d)
- 6) Inter process can be done through
  - Messages Mails b) a)
  - System calls d) Trap C)
- A binary semaphore \_\_\_\_ 7)
  - a) has value one or zero
  - is used for synchronization c)
- b) is essential to binary commuter
- LPC2148 has \_\_\_\_\_ on chip flash program memory. 8)
  - 32 KB 64 KB b)
  - 8 KB 16 KB c) d)

Max. Marks: 70

Marks: 14



Set

- None of above
- - d)

is used for mutual exclusion d)

			SLR-FM-259
			Set Q
9)	Total number of available ADC input a) 06 c) 12	s for l b) d)	-PC 2148 is 08 14
10)	In I <sup>2</sup> c standard mode, speed is given a) 200 kbps c) 100 kbps	as b) d)	400 kbps None of above
11)	ARM 7 Architecture support total a) 20 c) 32	in b) d)	terrupt sources. 30 10
12)	Inter-task or inter process communic using a) Semaphore c) Message queues	ation b) d)	in <i>μcos</i> II RTOS takes place Message mailbox All
13)	software is the part of kernel task will run next. a) Scheduler c) Mailbox	resp b) d)	onsible for determining which Semaphore Mutex
14)	SWAP instruction in the instruction s of instruction.	et of <i>i</i>	ARM processor is a special case

a)Arithmeticb)Logicalc)Load-Stored)Branch

## Seat B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Tuesday, 10-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- Assume suitable data if necessary.

#### Section – I

EMBEDDED SYSTEM DESIGN

#### Q.2 Solve any Four.

No.

- a) Draw & explain Hardware architecture of embedded system.
- b) What are the different applications of embedded system?
- c) Write the features of LPC 2148.
- d) Explain with code Interfacing of Relay to LPC 2148 in detail.
- e) Explain the communication protocol  $I^2C$  details.

#### Solve any Two. Q.3

- a) Draw ARM core architecture & explain each block of ARM core architecture in detail.
- Explain the following on chip peripherals of ARM 2148 in detail. b) RTC, WDT, PLL
- c) Explain the communication protocol USB in details.

#### Section – II

#### Q.4 Solve any Four.

- a) What are the features of  $\mu cos$  II RTOS?
- b) What is task scheduling? Explain various task scheduling algorithms.
- c) Explain with code Interfacing of LED for LPC 2148 in detail.
- d) Explain the concept of Semaphores with example.
- e) Explain Round Robin architecture. States its advantages and disadvantage.

#### Solve any Two. Q.5

- a) Write a short note on.
  - 1) Massage queues and mailboxes
  - 2) Pipes
- **b)** Explain in detail with neat diagrams Mobile Phones.
- c) Explain with code Interfacing of DAC to LPC 2148 in detail.



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# Set

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** EMBEDDED SYSTEM DESIGN

Day & Date: Tuesday, 10-12-2019 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 suitable 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) Inter-task or inter process communication in  $\mu cos$  II RTOS takes place using .
  - Semaphore a)
  - Message queues d) All C)
- 2) software is the part of kernel responsible for determining which task will run next.
  - Scheduler a)
  - Mailbox d) Mutex C)
- SWAP instruction in the instruction set of ARM processor is a special case 3) of instruction.
  - Arithmetic a) b) Logical
  - Load-Store d) Branch c)
- 4) Exception priorities are in the following descending order
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet a)
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet b)
  - Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet c)
  - Not in fixed order d)
- 5) Which of the following VIC having the highest priority? Non vectored interrupt request b)
  - a) Vectored interrupt request
  - Fast interrupt request C)
- A thread is a \_\_\_\_\_ process. 6)
  - Multi process a)
  - Light weight C)
- 7) Round robin scheduling
  - Allows interactive task quicker access to processor a)
  - Is guite complex to implement b)
  - Gives each task the same chance at the processor C)
  - None of above d)

Max. Marks: 70

**SLR-FM-259** 

R

- Marks: 14

b)

b)

d)

b)

d)

Message mailbox

None of the above

Inter thread process

None of above

Semaphore

				Set	R
8)	The a) b) c) d)	FIFO algorithm Execute first the job that last enter Execute first the job that first ent Execute first the job that has been None of above	ered t ered en in t	the queue the queue the queue the longest	
9)	Inte a) c)	r process can be done through Mails System calls	b) d)	Messages Trap	
10)	A bi a) c)	inary semaphore has value one or zero is used for synchronization	b) d)	is essential to binary commuter is used for mutual exclusion	
11)	LPC a) c)	C2148 has on chip flash p 32 KB 8 KB	rogra b) d)	m memory. 64 KB 16 KB	
12)	Tota a) c)	al number of available ADC inputs 06 12	for L b) d)	.PC 2148 is 08 14	
13)	In I <sup>2</sup> a) c)	c standard mode, speed is given 200 kbps 100 kbps	as b) d)	400 kbps None of above	
14)	ARI a) c)	M 7 Architecture support total 20 32	int b) d)	terrupt sources. 30 10	

## B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Day & Date: Tuesday, 10-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

#### Section – I

EMBEDDED SYSTEM DESIGN

#### Q.2 Solve any Four.

Seat

No.

- a) Draw & explain Hardware architecture of embedded system.
- b) What are the different applications of embedded system?
- c) Write the features of LPC 2148.
- d) Explain with code Interfacing of Relay to LPC 2148 in detail.
- e) Explain the communication protocol I<sup>2</sup>C details.

#### Q.3 Solve any Two.

- a) Draw ARM core architecture & explain each block of ARM core architecture in detail.
- **b)** Explain the following on chip peripherals of ARM 2148 in detail. RTC, WDT, PLL
- c) Explain the communication protocol USB in details.

#### Section – II

#### Q.4 Solve any Four.

- a) What are the features of  $\mu cos$  II RTOS?
- **b)** What is task scheduling? Explain various task scheduling algorithms.
- c) Explain with code Interfacing of LED for LPC 2148 in detail.
- d) Explain the concept of Semaphores with example.
- e) Explain Round Robin architecture. States its advantages and disadvantage.

#### Q.5 Solve any Two.

- a) Write a short note on.
  - 1) Massage queues and mailboxes
  - 2) Pipes
- b) Explain in detail with neat diagrams Mobile Phones.
- c) Explain with code Interfacing of DAC to LPC 2148 in detail.

Max. Marks: 56

12

16

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12

Set R

## SLR-FM-259

Seat	
No.	

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** EMBEDDED SYSTEM DESIGN

Day & Date: Tuesday, 10-12-2019 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 suitable data if necessary.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

C)

Marks: 14

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

b)

- 1) A thread is a \_\_\_\_\_ process.
  - a) Multi process
    - Inter thread process Light weight None of above d)
- Round robin scheduling \_\_\_\_ 2)
  - Allows interactive task quicker access to processor a)
  - Is guite complex to implement b)
  - Gives each task the same chance at the processor C)
  - None of above d)

#### The FIFO algorithm . 3)

- a) Execute first the job that last entered the queue
- b) Execute first the job that first entered the queue
- Execute first the job that has been in the queue the longest c)
- None of above d)
- Inter process can be done through \_ 4)
  - Mails Messages a) b) c) System calls d) Trap
- A binary semaphore \_\_\_\_\_. 5)
  - has value one or zero a) is used for synchronization c)
- b) is essential to binary commuter
- is used for mutual exclusion d)
- LPC2148 has \_\_\_\_\_ on chip flash program memory. 6)
  - a) 32 KB 64 KB b) 8 KB C) d) 16 KB
- Total number of available ADC inputs for LPC 2148 is . 7)
  - a) 06 b) 08
    - 12 d) 14 C)
- In I<sup>2</sup>c standard mode, speed is given as 8) 200 kbps 400 kbps a) b)
  - 100 kbps d) None of above c)
- ARM 7 Architecture support total 9) interrupt sources.
  - 20 b) 30 a) c) 32 d) 10



Max. Marks: 70

- 10) Inter-task or inter process communication in  $\mu cos$  II RTOS takes place using \_ b) Message mailbox
  - a) Semaphore C)
    - d) Message queues
- 11) software is the part of kernel responsible for determining which task will run next.
  - Scheduler a) Mailbox C)
    - b) Semaphore d) Mutex

All

- SWAP instruction in the instruction set of ARM processor is a special case 12) of \_\_\_\_\_ instruction.
  - Arithmetic b) Logical a)
  - Load-Store Branch C) d)
- Exception priorities are in the following descending order \_\_\_\_ 13)
  - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet a)
    - Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet b)
    - Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet C)
    - Not in fixed order d)
- 14) Which of the following VIC having the highest priority?
  - Vectored interrupt request a)
- Non vectored interrupt request b) d) None of the above
- c) Fast interrupt request

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## B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Day & Date: Tuesday, 10-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data if necessary.

#### Section – I

EMBEDDED SYSTEM DESIGN

#### Q.2 Solve any Four.

Seat

No.

- a) Draw & explain Hardware architecture of embedded system.
- b) What are the different applications of embedded system?
- c) Write the features of LPC 2148.
- d) Explain with code Interfacing of Relay to LPC 2148 in detail.
- e) Explain the communication protocol I<sup>2</sup>C details.

#### Q.3 Solve any Two.

- a) Draw ARM core architecture & explain each block of ARM core architecture in detail.
- **b)** Explain the following on chip peripherals of ARM 2148 in detail. RTC, WDT, PLL
- c) Explain the communication protocol USB in details.

#### Section – II

#### Q.4 Solve any Four.

- a) What are the features of  $\mu cos$  II RTOS?
- **b)** What is task scheduling? Explain various task scheduling algorithms.
- c) Explain with code Interfacing of LED for LPC 2148 in detail.
- d) Explain the concept of Semaphores with example.
- e) Explain Round Robin architecture. States its advantages and disadvantage.

#### Q.5 Solve any Two.

- a) Write a short note on.
  - 1) Massage queues and mailboxes
  - 2) Pipes
- b) Explain in detail with neat diagrams Mobile Phones.
- c) Explain with code Interfacing of DAC to LPC 2148 in detail.



Max. Marks: 56

12

16

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SLR-FM-259

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### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SATELLITE COMMUNICATION

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 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 and rewrite the sentence. 14

- 1) Apogee is
  - The point farthest from the Earth a)
  - The point closest approach to the earth b)
  - The point on the earth surface c)
  - d) The point on the Equator

#### 2) What is the application of satellite systems?

- a) Weather forecasting Terrestrial communication b) c) Point to Point communication
- IN GPS which code has high accuracy? 3)
  - a) C/A b)
  - c) Both a and b d)
- 4) Bent pipe is a type of \_\_\_\_\_
  - a) Waveguide b) LNB
  - c) Transponder d) Antenna
- The transmitter-receiver combination in the satellite is known as a 5)
  - Relav a) b) Repeater
  - c) Transponder d) Duplexer
- The downlink frequency is lower than the uplink frequency. 6)
  - False a) True b)
- 7) What is the reason for carrying multiple transponders in a satellite?
  - a) More number of operating channel
  - b) Better reception
  - More gain c)
  - d) Redundancy
- Which of the following bands cannot be used for satellite communication? 8)
  - MF Ku a) b)
  - c) X d) С

Set



Max. Marks: 70

Marks: 14

d) None of above

- Ρ
- None of above

		Set P
9)	Assuming earth to be a sphere of radius geosynchronous satellite above Earth a geosynchronous satellite is km/ a) 28000 b) c) 36000 d)	s 6400 km and height of a s 36000 km, the velocity of a 'hr. 15000 11100
10)	To cover all inhabited regions of the Eargeosynchronous communication satellita) 5b)c) 10d)	rth, the number of es required 3 2
11)	<ul> <li>A geosynchronous satellite</li> <li>a) has the same period a that of the E</li> <li>b) has a circular orbit</li> <li>c) rotates in the equatorial plane</li> <li>d) has all of the above</li> </ul>	arth
12)	Frequency range of C-Band isa) 16-32 GHZb)c) 4-8 GHZd)	8-16 GHZ 1-2 GHZ
13)	GPS satellites are Satellites.a) GEOb)c) LEOd)	MEO None of above
14)	The one way propagation time delay ofa) 2.7msb)c) 110msd)	MEO satellite is 34.5ms 119.3ms

SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four.

- A quasi-GEO satellite is in a circular orbit close to geosynchronous altitude. The quasi-GEO, satellite, however does not have a period of one sidereal day, its orbital period is exactly 24 h, i.e one solar day. Calculate
  - 1) The radius of the orbit.
  - 2) The rate of drift around the equator of the sub satellite point in degree per solar day.
  - 3) The satellite is drifting across the sky, is the satellite moving towards the east or towards the west.
- b) A satellite is at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find flux density at the receiving point, and the power received by the antenna at this point with an effective area of 10m<sup>2</sup>.
- c) Write a short note on development of satellite communication.
- d) Describe Attitude and Orbit Control System.
- e) Describe Uplink design.

#### Q.3 Attempt any two.

- a) Explain Orbital perturbations, Launchers and Launch vehicles.
- b) Explain calculations for system noise temperature.
- c) Explain Communication subsystem of satellite.

#### Section – II

#### Attempt any four. 16 Q.4 Explain in detail RF Equipment for earth station. a) Explain Tropospheric and ionospheric Scintillations. b) What is GPS position location principle? Explain in detail. C) Describe in detail VSAT system. d) Explain Earth station testing. e) 12 Q.5 Attempt any two. Explain earth station design considerations. a) Write a short note on Digital DBS TV. b) Explain different propagation effects in satellite communication. C)

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

Max. Marks: 56

16

12

Set F

Seat No.

## B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication 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.

SATELLITE COMMUNICATION

- 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 and rewrite the sentence. 14

- Which of the following bands cannot be used for satellite communication? 1)
  - a) MF Ku b)
  - c) X d) С
- 2) Assuming earth to be a sphere of radius 6400 km and height of a geosynchronous satellite above Earth as 36000 km, the velocity of a geosynchronous satellite is \_\_\_\_\_ km/hr.
  - a) 28000 b) 15000
  - c) 36000 d) 11100

To cover all inhabited regions of the Earth, the number of 3) geosynchronous communication satellites required ...

- a) 5 b) 3
- 2 c) 10 d)
- 4) A geosynchronous satellite
  - a) has the same period a that of the Earth
  - b) has a circular orbit
  - c) rotates in the equatorial plane
  - d) has all of the above

#### 5) Frequency range of C-Band is \_\_\_\_\_

- 16-32 GHZ b) 8-16 GHZ a)
- 4-8 GHZ 1-2 GHZ C) d)
- GPS satellites are \_\_\_\_\_ Satellites. 6)
  - a) GEO MEO b) c)
    - LEO d) None of above
- 7) The one way propagation time delay of MEO satellite is \_\_\_\_\_. a) 2.7ms
  - 34.5ms b)
  - c) 110ms 119.3ms d)
- 8) Apogee is \_\_\_\_
  - a) The point farthest from the Earth
  - b) The point closest approach to the earth
  - c) The point on the earth surface
  - d) The point on the Equator

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Max. Marks: 70

Marks: 14

Set 9) What is the application of satellite systems? a) Weather forecasting **Terrestrial communication** b) c) Point to Point communication d) None of above IN GPS which code has high accuracy? a) C/A b) Ρ c) Both a and b None of above d) 11) Bent pipe is a type of \_\_\_\_\_. a) Waveguide b) LNB c) Transponder Antenna d) The transmitter-receiver combination in the satellite is known as a Relay b) a) Repeater c) Transponder Duplexer d) The downlink frequency is lower than the uplink frequency. 13) False a) True b)

- 14) What is the reason for carrying multiple transponders in a satellite? a) More number of operating channel
  - b) Better reception
  - C)
  - d) Redundancy

**SLR-FM-260** 

- 10)

#### 12)

- - More gain

Set

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four.

- A quasi-GEO satellite is in a circular orbit close to geosynchronous altitude. The quasi-GEO, satellite, however does not have a period of one sidereal day, its orbital period is exactly 24 h, i.e one solar day. Calculate
  - 1) The radius of the orbit.
  - 2) The rate of drift around the equator of the sub satellite point in degree per solar day.
  - 3) The satellite is drifting across the sky, is the satellite moving towards the east or towards the west.
- b) A satellite is at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find flux density at the receiving point, and the power received by the antenna at this point with an effective area of 10m<sup>2</sup>.
- c) Write a short note on development of satellite communication.
- d) Describe Attitude and Orbit Control System.
- e) Describe Uplink design.

#### Q.3 Attempt any two.

- a) Explain Orbital perturbations, Launchers and Launch vehicles.
- b) Explain calculations for system noise temperature.
- c) Explain Communication subsystem of satellite.

#### Section – II

#### Attempt any four. 16 Q.4 Explain in detail RF Equipment for earth station. a) Explain Tropospheric and ionospheric Scintillations. b) What is GPS position location principle? Explain in detail. C) Describe in detail VSAT system. d) Explain Earth station testing. e) 12 Q.5 Attempt any two. Explain earth station design considerations. a) Write a short note on Digital DBS TV. b) Explain different propagation effects in satellite communication. C)

Max. Marks: 56

12

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

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 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 and rewrite the sentence. 14

- 1) The transmitter-receiver combination in the satellite is known as a
  - a) Relay

C)

- b) Repeater
- d) Duplexer
- 2) The downlink frequency is lower than the uplink frequency.a) Trueb) False
- 3) What is the reason for carrying multiple transponders in a satellite?
  - a) More number of operating channel
  - b) Better reception

Transponder

- c) More gain
- d) Redundancy
- 4) Which of the following bands cannot be used for satellite communication?
   a) MF
   b) Ku
  - c) X d) C
- 5) Assuming earth to be a sphere of radius 6400 km and height of a geosynchronous satellite above Earth as 36000 km, the velocity of a geosynchronous satellite is \_\_\_\_\_ km/hr.
  - a) 28000 b) 15000
  - c) 36000 d) 11100

6) To cover all inhabited regions of the Earth, the number of geosynchronous communication satellites required \_\_\_\_\_.

- a) 5 b) 3
- c) 10 d) 2
- 7) A geosynchronous satellite \_\_\_\_
  - a) has the same period a that of the Earth
  - b) has a circular orbit
  - c) rotates in the equatorial plane
  - d) has all of the above
- 8) Frequency range of C-Band is \_\_\_\_\_
  - a) 16-32 GHZ b) 8-16 GHZ c) 4-8 GHZ d) 1-2 GHZ

Set R

Max. Marks: 70

Marks: 14

Set R

- GPS satellites are \_\_\_\_\_ Satellites. 9) b)
  - a) GEO c) LEO

- MEO
- d) None of above
- The one way propagation time delay of MEO satellite is \_\_\_\_\_. 10)
  - a) 2.7ms b) 34.5ms c) 110ms
    - d) 119.3ms

- 11) Apogee is \_\_\_\_
  - \_. a) The point farthest from the Earth
  - b) The point closest approach to the earth
  - c) The point on the earth surface
  - d) The point on the Equator
- What is the application of satellite systems? 12)
  - a) Weather forecasting b)
  - c) Point to Point communication
- IN GPS which code has high accuracy? 13)
  - a) C/A
  - b) c) Both a and b d)
- Bent pipe is a type of \_\_\_\_\_. 14)
  - a) Waveguide
  - b) c) Transponder d)
- **Terrestrial communication** None of above
- d)

None of above

Ρ

LNB

Antenna

Set

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four.

- A quasi-GEO satellite is in a circular orbit close to geosynchronous altitude. The quasi-GEO, satellite, however does not have a period of one sidereal day, its orbital period is exactly 24 h, i.e one solar day. Calculate
  - 1) The radius of the orbit.
  - 2) The rate of drift around the equator of the sub satellite point in degree per solar day.
  - 3) The satellite is drifting across the sky, is the satellite moving towards the east or towards the west.
- b) A satellite is at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find flux density at the receiving point, and the power received by the antenna at this point with an effective area of 10m<sup>2</sup>.
- c) Write a short note on development of satellite communication.
- d) Describe Attitude and Orbit Control System.
- e) Describe Uplink design.

#### Q.3 Attempt any two.

- a) Explain Orbital perturbations, Launchers and Launch vehicles.
- b) Explain calculations for system noise temperature.
- c) Explain Communication subsystem of satellite.

#### Section – II

#### Attempt any four. 16 Q.4 Explain in detail RF Equipment for earth station. a) Explain Tropospheric and ionospheric Scintillations. b) What is GPS position location principle? Explain in detail. C) Describe in detail VSAT system. d) Explain Earth station testing. e) 12 Q.5 Attempt any two. Explain earth station design considerations. a) Write a short note on Digital DBS TV. b) Explain different propagation effects in satellite communication. C)

Max. Marks: 56

12

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SATELLITE COMMUNICATION

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 the right indicate full marks.
- 3) Assume suitable 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) To cover all inhabited regions of the Earth, the number of geosynchronous communication satellites required ...
  - 5 a) b) 3 d) 2
  - c) 10
- 2) A geosynchronous satellite \_\_\_\_\_.
  - a) has the same period a that of the Earth
  - b) has a circular orbit
  - c) rotates in the equatorial plane
  - d) has all of the above
- Frequency range of C-Band is \_\_\_\_ 3)
  - a) 16-32 GHZ b) 8-16 GHZ
  - c) 4-8 GHZ 1-2 GHZ d)
- GPS satellites are Satellites. 4)
  - a) GEO MEO b) c) LEO
    - d) None of above

#### The one way propagation time delay of MEO satellite is . 5)

- a) 2.7ms 34.5ms b)
  - c) 110ms d) 119.3ms
- 6) Apogee is \_\_\_\_\_.
  - a) The point farthest from the Earth
  - The point closest approach to the earth b)
  - The point on the earth surface C)
  - d) The point on the Equator
- What is the application of satellite systems? 7)
  - a) Weather forecasting **Terrestrial communication** b)
  - c) Point to Point communication None of above d)
- IN GPS which code has high accuracy? 8)
  - a) C/A Ρ b)
  - c) Both a and b d) None of above

Set

Max. Marks: 70

Marks: 14



#### 9) Bent pipe is a type of \_\_\_\_\_.

- a) Waveguide
- c) Transponder d) Antenna
- 10) The transmitter-receiver combination in the satellite is known as a
  - \_\_\_\_\_. a) Relay
- b) Repeater

LNB

b)

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Set S

- c) Transponder d) Duplexer
- 11) The downlink frequency is lower than the uplink frequency.
  - a) True b) False

#### 12) What is the reason for carrying multiple transponders in a satellite?

- a) More number of operating channel
- b) Better reception
- c) More gain
- d) Redundancy

#### 13) Which of the following bands cannot be used for satellite communication?

- a) MF b) Ku c) X d) C
- 14) Assuming earth to be a sphere of radius 6400 km and height of a geosynchronous satellite above Earth as 36000 km, the velocity of a geosynchronous satellite is \_\_\_\_\_ km/hr.
  - a) 28000 b) 15000 c) 36000 d) 11100

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four.

- A quasi-GEO satellite is in a circular orbit close to geosynchronous altitude. The quasi-GEO, satellite, however does not have a period of one sidereal day, its orbital period is exactly 24 h, i.e one solar day. Calculate
  - 1) The radius of the orbit.
  - 2) The rate of drift around the equator of the sub satellite point in degree per solar day.
  - 3) The satellite is drifting across the sky, is the satellite moving towards the east or towards the west.
- b) A satellite is at a distance of 40,000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find flux density at the receiving point, and the power received by the antenna at this point with an effective area of 10m<sup>2</sup>.
- c) Write a short note on development of satellite communication.
- d) Describe Attitude and Orbit Control System.
- e) Describe Uplink design.

#### Q.3 Attempt any two.

- a) Explain Orbital perturbations, Launchers and Launch vehicles.
- b) Explain calculations for system noise temperature.
- c) Explain Communication subsystem of satellite.

#### Section – II

#### Attempt any four. 16 Q.4 Explain in detail RF Equipment for earth station. a) Explain Tropospheric and ionospheric Scintillations. b) What is GPS position location principle? Explain in detail. C) Describe in detail VSAT system. d) Explain Earth station testing. e) 12 Q.5 Attempt any two. Explain earth station design considerations. a) Write a short note on Digital DBS TV. b) Explain different propagation effects in satellite communication. C)

Max. Marks: 56

16

12

Set S
Set

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering DATABASE MANAGEMENT SYSTEM (DBMS)**

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.
- 4) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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No.

#### Q.1 Choose the correct alternatives from the options.

- 1) What is an Instance of a Database?
  - The logical design of the database system a)
  - The entire set of attributes of the Database b)
  - The state of the database system at any given point of time C)
  - The initial values inserted into the Database immediately after its d) creation
- 2) A command to remove a relation from an SQL database.
  - a) Delete Table b) Drop Table
  - c) Erase Table d) Alter Table
- 3)  $\sigma$  year > 2009 (book  $\bowtie$  borrow) will \_\_\_\_
  - Select all tuples from the Cartesian product of book and borrow a)
  - Select all tuples from the natural join of book and borrow where the b) year is greater than 2009
  - Select all the books which are borrowed after the year 2009 c)
  - d) Both b) and c)
- 4) We apply the aggregate function to a group of sets of tuples using the clause.
  - a) group by b) Group
  - group set d) group attribute c)

5) The operator that performs pattern matching is

- BETWEEN **EXISTS** a) b) c) LIKE d) None of these
- Which SQL command is used to sort the result set? 6)
  - a) Sort by b) Sort
  - c) Order d) Order by
- 7) A transaction is in state after the final statement has been executed.
  - a) Active Committed b)
  - c) Partially Committed d)
- The characteristic/s of transaction/s is/are 8)
  - Atomicity a)

C)

Isolation

- None of these
- Durability b)
- d) All the above

Max. Marks: 70

Marks: 14

Transaction a) b) Data Commit Data Rollback d) **Data Automation** c) The "all-or-none" property is commonly referred to as \_\_\_\_\_. 10) a) Isolation b) Atomicitv d) c) Durability All the above Two phase locking protocol ensures \_ 11) a) Serializability b) Freedom from deadlock c) Cascadeless Schedule d) None of these A deadlock exists in the system if and only if the wait for graph contains a 12) Cycle Direction a) b) Rotation d) **Bi-direction** c) I and J are \_\_\_\_\_ if they are operations in different transactions 13) performed on the same data item, and at least one of them is a write operation. a) Conflicting b) Overwriting c) Isolated d) Durable

Collection of operations that form a single logical unit of work are called

- 14) \_\_\_\_\_ index has an index entry for every search key value in the data file.
  - a) Sparse

9)

c) Both a and b

b) Densed) None of these

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Set

Ρ

Set

Max. Marks: 56

Ρ

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

### Q.2 Attempt any three.

- a) Define the following terms with example: Entity, Multi-valued Attribute, Composite Attribute, Derived Attribute
- **b)** Define and explain second normal form.
- c) Explain different types of keys for entity set in database with example for each.
- d) Explain any four aggregate functions with example.

#### Q.3 Attempt any two.

- a) Write SQL queries for following statements.
   Student (Enrno, name, courseld, emailld, cellno)
   Course (courseld, course\_nm, duration)
  - 1) Find out list of students who have enrolled in "computer" course.
  - 2) List name of all courses with their duration.
  - 3) List name of all students start with 'a'.
  - 4) List email Id and cell no of all mechanical engineering students.
- **b)** What is DBMS? Name at least 3 DBMSs. List and explain the drawbacks of file system.
- c) Explain Fundamental and additional relational algebra operations with example.

#### Section – II

#### Q.4 Attempt any three.

- a) Explain the various transaction states with a neat transaction state diagram.
- **b)** Explain ACID properties of transaction.
- c) Explain types of failures.
- d) Define deadlock. Explain the concept of deadlock in transactions with example.

#### Q.5 Attempt any two.

- a) What is concurrency control? Explain two-phase locking protocol in detail and list its two drawbacks.
- **b)** What is the need for indexing? Explain primary, clustering and secondary index.
- c) Write short note on conflict and view serializability.

16

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			DATABASE MANAGEME	ENT	SYSTEM (DBMS)
Day Time	& Date : 02:30	e: Sa 0 PN	turday,14-12-2019 1 To 05:30 PM		Max. Marks: 70
Instr	uctior	າ <b>ຣ</b> : 1	) Q. No. 1 is compulsory and she	ould b	e solved in first 30 minutes in answer
		2	book. 2) Figures to the right indicate ful 4) Assume suitable data if necess	l mark sary.	S.
			MCQ/Objective T	ype (	Questions
Dura	tion: 3	0 Mi	nutes		Marks: 14
Q.1	Choo	ose t	the correct alternatives from the	ne opt	tions. 14
	1)	⊺ne a) c)	Atomicity Isolation	b) d)	Durability All the above
	2)	Col	lection of operations that form a	single	logical unit of work are called
		a) c)	 Transaction Data Rollback	b) d)	Data Commit Data Automation
	3)	Th∉ a) c)	e "all-or-none" property is commo Isolation Durability	only re b) d)	ferred to as Atomicity All the above
	4)	Two a) c)	o phase locking protocol ensures Serializability Cascadeless Schedule	s b) d)	 Freedom from deadlock None of these
	5)	A d	eadlock exists in the system if a	nd onl	y if the wait for graph contains a
		a) c)	 Cycle Rotation	b) d)	Direction Bi-direction
	6)	l ar per ope	nd J are if they are operati formed on the same data item, a eration. Conflicting	ons ir Ind at	a different transactions least one of them is a write
		c)	Isolated	d)	Durable
	7)	a) c)	index has an index entry for on Sparse Both a and b	every b) d)	search key value in the data file. Dense None of these
	8)	Wh a) b) c) d)	at is an Instance of a Database? The logical design of the database The entire set of attributes of th The state of the database syste The initial values inserted into the	ase sy e Data m at a he Da	rstem abase any given point of time tabase immediately after its

B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** 

Seat

No.

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s inserted into the Database immediate creation

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Q

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- 9) A command to remove a relation from an SQL database.
  - a) Delete Table
- Drop Table b)

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- c) Erase Table
- Alter Table d)
- 10)  $\sigma$  year > 2009 (book  $\bowtie$  borrow) will \_
  - Select all tuples from the Cartesian product of book and borrow a)
  - Select all tuples from the natural join of book and borrow where the b) year is greater than 2009
  - c) Select all the books which are borrowed after the year 2009
  - d) Both b) and c)
- 11) We apply the aggregate function to a group of sets of tuples using the clause.
  - a) group by
- b) Group
- c) group set d) group attribute
- 12) The operator that performs pattern matching is
  - a) BETWEEN b) EXISTS
  - c) LIKE d) None of these
- Which SQL command is used to sort the result set? 13)
  - a) Sort by c) Order

- Sort b)
- Order by d)
- A transaction is in state after the final statement has been executed. 14)
  - Active a)
  - c) Partially Committed
- Committed b) None of these d)

Set

Max. Marks: 56

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any three.

- a) Define the following terms with example: Entity, Multi-valued Attribute, Composite Attribute, Derived Attribute
- **b)** Define and explain second normal form.
- c) Explain different types of keys for entity set in database with example for each.
- d) Explain any four aggregate functions with example.

#### Q.3 Attempt any two.

- a) Write SQL queries for following statements.
   Student (Enrno, name, courseld, emailld, cellno)
   Course (courseld, course\_nm, duration)
  - 1) Find out list of students who have enrolled in "computer" course.
  - 2) List name of all courses with their duration.
  - 3) List name of all students start with 'a'.
  - 4) List email Id and cell no of all mechanical engineering students.
- **b)** What is DBMS? Name at least 3 DBMSs. List and explain the drawbacks of file system.
- c) Explain Fundamental and additional relational algebra operations with example.

#### Section – II

#### Q.4 Attempt any three.

- a) Explain the various transaction states with a neat transaction state diagram.
- **b)** Explain ACID properties of transaction.
- c) Explain types of failures.
- d) Define deadlock. Explain the concept of deadlock in transactions with example.

#### Q.5 Attempt any two.

- a) What is concurrency control? Explain two-phase locking protocol in detail and list its two drawbacks.
- **b)** What is the need for indexing? Explain primary, clustering and secondary index.
- c) Write short note on conflict and view serializability.

16

12

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		Electronics & Telecomm DATABASE MANAGEM	unic ENT	ation Engineering SYSTEM (DBMS)
Day a Time	& Date : 02:30	e: Saturday,14-12-2019 0 PM To 05:30 PM		Max. Marks: 70
Instr	uctior	ns: 1) Q. No. 1 is compulsory and sh	ould b	be solved in first 30 minutes in answer
		<ul><li>2) Figures to the right indicate fu</li><li>4) Assume suitable data if neces</li></ul>	ll marl sary.	KS.
		MCQ/Objective T	ype	Questions
Dura	tion: 3	0 Minutes		Marks: 14
Q.1	<b>Choo</b> 1)	The operator that performs pattern a) BETWEEN c) LIKE	he op match b) d)	tions. 14 hing is EXISTS None of these
	2)	Which SQL command is used to so a) Sort by c) Order	ort the b) d)	result set? Sort Order by
	3)	<ul><li>A transaction is in state after a)</li><li>Active</li><li>c) Partially Committed</li></ul>	the fin b) d)	al statement has been executed. Committed None of these
	4)	The characteristic/s of transaction/s a) Atomicity c) Isolation	s is/are b) d)	Durability All the above
	5)	Collection of operations that form a	single	e logical unit of work are called
		a) Transaction c) Data Rollback	b) d)	Data Commit Data Automation
	6)	The "all-or-none" property is comm a) Isolation c) Durability	only re b) d)	eferred to as Atomicity All the above
	7)	Two phase locking protocol ensure a) Serializability c) Cascadeless Schedule	s b) d)	 Freedom from deadlock None of these
	8)	A deadlock exists in the system if a	nd on	ly if the wait for graph contains a
		a) Cycle c) Rotation	b) d)	Direction Bi-direction
	9)	I and J are if they are operate performed on the same data item, a operation. a) Conflicting c) Isolated	ions ir and at b)	n different transactions least one of them is a write Overwriting Durable

### Seat No.

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019

Set

R

Set R

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- 10) \_\_\_\_\_ index has an index entry for every search key value in the data file.
  - a) Sparse

b) Dense

c) Both a and b

- d) None of these
- 11) What is an Instance of a Database?
  - a) The logical design of the database system
  - b) The entire set of attributes of the Database
  - c) The state of the database system at any given point of time
  - d) The initial values inserted into the Database immediately after its creation
- 12) A command to remove a relation from an SQL database.
  - a) Delete Table b) Drop Table
  - c) Erase Table d) Alter Table
- 13)  $\sigma$  year > 2009 (book  $\bowtie$  borrow) will \_\_\_\_
  - a) Select all tuples from the Cartesian product of book and borrow
  - b) Select all tuples from the natural join of book and borrow where the year is greater than 2009
  - c) Select all the books which are borrowed after the year 2009
  - d) Both b) and c)
- 14) We apply the aggregate function to a group of sets of tuples using the \_\_\_\_\_ clause.
  - a) group by
  - c) group set

- b) Group
- d) group attribute

Set

Max. Marks: 56

R

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any three.

- a) Define the following terms with example: Entity, Multi-valued Attribute, Composite Attribute, Derived Attribute
- b) Define and explain second normal form.
- c) Explain different types of keys for entity set in database with example for each.
- d) Explain any four aggregate functions with example.

#### Q.3 Attempt any two.

- Write SQL queries for following statements.
   Student (Enrno, name, courseld, emailld, cellno)
   Course (courseld, course\_nm, duration)
  - 1) Find out list of students who have enrolled in "computer" course.
  - 2) List name of all courses with their duration.
  - 3) List name of all students start with 'a'.
  - 4) List email ld and cell no of all mechanical engineering students.
- **b)** What is DBMS? Name at least 3 DBMSs. List and explain the drawbacks of file system.
- c) Explain Fundamental and additional relational algebra operations with example.

#### Section – II

#### Q.4 Attempt any three.

- a) Explain the various transaction states with a neat transaction state diagram.
- **b)** Explain ACID properties of transaction.
- c) Explain types of failures.
- d) Define deadlock. Explain the concept of deadlock in transactions with example.

#### Q.5 Attempt any two.

- a) What is concurrency control? Explain two-phase locking protocol in detail and list its two drawbacks.
- **b)** What is the need for indexing? Explain primary, clustering and secondary index.
- c) Write short note on conflict and view serializability.

16

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Seat	
No.	

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering DATABASE MANAGEMENT SYSTEM (DBMS)**

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.

- 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 "all-or-none" property is commonly referred to as . 1) Atomicity b)
  - Isolation a)
  - All the above Durability c) d)
- 2) Two phase locking protocol ensures
  - a) Serializability b) Freedom from deadlock
  - c) Cascadeless Schedule d) None of these
- A deadlock exists in the system if and only if the wait for graph contains a 3)
  - a) Cycle b) Direction
  - Rotation d) **Bi-direction** c)
- I and J are if they are operations in different transactions 4) performed on the same data item, and at least one of them is a write operation. Overwriting
  - Conflicting a) b)
  - Isolated d) Durable c)
- 5) index has an index entry for every search key value in the data file. Dense
  - Sparse b) a)
  - c) Both a and b None of these d)
- 6) What is an Instance of a Database?
  - a) The logical design of the database system
  - The entire set of attributes of the Database b)
  - The state of the database system at any given point of time c)
  - d) The initial values inserted into the Database immediately after its creation
- 7) A command to remove a relation from an SQL database.
  - a) Delete Table

**SLR-FM-261** 

Set

Max. Marks: 70

Marks: 14

Set S

- 8)  $\sigma$  year > 2009 (book  $\bowtie$  borrow) will \_\_\_\_\_.
  - a) Select all tuples from the Cartesian product of book and borrow
  - Select all tuples from the natural join of book and borrow where the b) year is greater than 2009
  - Select all the books which are borrowed after the year 2009 c)
  - d) Both b) and c)
- 9) We apply the aggregate function to a group of sets of tuples using the clause.
  - group by a)

- b) Group
- c) group set d) group attribute
- The operator that performs pattern matching is 10)
  - BETWEEN b) EXISTS a)
  - c) LIKE d) None of these
- 11) Which SQL command is used to sort the result set?
  - a) Sort by b) Sort
    - c) Order Order by d)
- A transaction is in \_\_\_\_\_ state after the final statement has been executed. 12) Committed
  - a) Active b)
  - c) Partially Committed None of these d)
- 13) The characteristic/s of transaction/s is/are
  - Durability a) Atomicity b)
  - c) Isolation All the above d)
- Collection of operations that form a single logical unit of work are called 14)
  - a) Transaction
  - Data Rollback c)
- b) Data Commit
- d) Data Automation

### Seat No.

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

### Q.2 Attempt any three.

- a) Define the following terms with example: Entity, Multi-valued Attribute, Composite Attribute, Derived Attribute
- **b)** Define and explain second normal form.
- c) Explain different types of keys for entity set in database with example for each.
- d) Explain any four aggregate functions with example.

#### Q.3 Attempt any two.

- a) Write SQL queries for following statements.
   Student (Enrno, name, courseld, emailld, cellno)
   Course (courseld, course\_nm, duration)
  - 1) Find out list of students who have enrolled in "computer" course.
  - 2) List name of all courses with their duration.
  - 3) List name of all students start with 'a'.
  - 4) List email Id and cell no of all mechanical engineering students.
- **b)** What is DBMS? Name at least 3 DBMSs. List and explain the drawbacks of file system.
- c) Explain Fundamental and additional relational algebra operations with example.

#### Section – II

#### Q.4 Attempt any three.

- a) Explain the various transaction states with a neat transaction state diagram.
- **b)** Explain ACID properties of transaction.
- c) Explain types of failures.
- d) Define deadlock. Explain the concept of deadlock in transactions with example.

#### Q.5 Attempt any two.

- a) What is concurrency control? Explain two-phase locking protocol in detail and list its two drawbacks.
- **b)** What is the need for indexing? Explain primary, clustering and secondary index.
- c) Write short note on conflict and view serializability.

Max. Marks: 56

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			IMAGE & VIDEO	PR(	DCESSING
Day & Time:	Date 02:3	e: Tu 0 PN	esday, 17-12-2019 1 To 05:30 PM		Max. Marks: 70
Instru	ctior	<b>າຣ:</b> 1 2	) Q. No. 1 is compulsory and sh book. ) Assume suitable data whereve	nould r.	l be solved in first 30 minutes in answer
			MCQ/Objective T	уре	Questions
Durati	on: 3	0 Mi	nutes		Marks: 14
Q.1	<b>Chc</b> 1)	oose Sma a) c)	<b>the correct alternatives from t</b> allest part of an neighbour pixels Pixel Kernel	<b>he d</b> is ca b) d)	ptions. 14 alled as Pel Coefficient
	2)	Pixe radi a) c)	el having Euclidean distance fron us centred at (x, y). Disk Square	n f(x, b) d)	y) from a shape with Diamond Pyramid
	3)	YU\ a) c)	/ color models family are useful i Display devices Color TV broadcasting	n b) d)	applications. Printing applications None
	4)	s= c posi a) c)	r <sup>v</sup> , where S-output grey level, r- itive constant; means Negative Bit plane slicing	input b) d)	t grey level, c-positive constant, v- Log transform Power law
	5)	lf nu	umber of storage bits are 524288	for	8-bit image, then size of image is
		a) c)	 256 x 256 512 x 512	b) d)	128 x 128 1024 x 1024
	6)	H(U	$(V) = 1 - e \frac{-D^2(U,V)}{2\sigma^2}$ is equation for	or	in frequency domain.
		a) c)	Butterworth HPF Ideal HPF	b) d)	Gaussian HPF None of these
	7)	Full a) c)	color image means 8-bit 16-bit	b) d)	24-bit 4-bit
	8)	The a) c)	symbol ★ indicates Correlation Multiplication	b) d)	Convolution None
	9)	The	equation Hi(U, V) = $\frac{1}{H(U,V)}$ for		_ filter.
		a) c)	Inverse filter Weiner	b) d)	Pseudo-Inverse None

# B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

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c) 
$$P(z) = ae^{-az}$$
 for  $Z > 0$ 

#### B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING** Day & Date: Tuesday, 17-12-2019 Max. Marks: 56

Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Attempt any Four.

Seat

No.

- Explain Image sampling and quantization. a)
- Explain the types of Log transformation. b)
- c) Explain types Low pass filters used for image smoothing.
- Explain Image opening and closing process with example. d)
- Draw intensity level slicing on 3 BPP image. Let  $r_1=3$  and  $r_2=5$ . e)

	,		0	
2	1	2	2	1
2	3	4	5	2
6	2	7	6	0
2	6	6	5	1
0	3	2	2	1

#### Q.3 Attempt any two.

- Explain K-L transform in details. a)
- Explain the following edge detection operatorsb)
  - 1) Gradient operator
  - Pewits' operator 2)
  - Soble operator 3)
- Explain Regional Processing method for edge linking. c)

#### Section – II

#### Q.4 Attempt any Four.

- Explain Image degradation Model. a)
- Explain Sampling structure for Digital Video. b)
- Explain Principle of Color Video camera. c)
- Explain 3-D sampling. d)
- e) Explain Gaussian Noise and Rayleigh noise mode.

#### Q.5 Attempt any two.

- Explain Inverse Filter for image restoration. a)
- Explain 2-D rectangular sampling. b)
- Explain Optical flow equation. C)

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1)	The a) c)	symbol ★ indicates Correlation Multiplication	b) d)	Convolution None
2)	The	equation Hi(U, V) = $\frac{1}{H(U,V)}$ for		_filter.
	a) c)	Inverse filter Weiner	b) d)	Pseudo-Inverse None
3)	Digi dire	tal video can be obtained by san ction along the scan lines.	nplin	g analog video in the
	a) c)	Horizontal Ratsra	b) d)	None
4)	2-D a) c)	motion, also called Rejected motion Optical flow motion	b) d)	Projected motion None
5)	$\frac{\partial s_c}{\partial z}$	$\frac{\partial v(x;t)}{\partial x_1}v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2}v_2(x,t) +$	$\frac{\partial s_c}{\partial s_c}$	$\frac{(x;t)}{\partial t} = 0$ is called as
	a) c)	Optical flow equation optimization method	b) d)	Motion estimation None
6)	The a) c)	symbol — represents o Erosion Thinning	pera b) d)	ition. Dilation Thickening
7)	The a)	PDF of pepper and salt noise is P(z) = Pa for $Z = a= Pb$ for $Z = b= 0$ otherwise	repr	esented by
	b)	$P(z) = \frac{1}{b-a} \text{ for } a < z < b$		
	c) d)	$P(z) = ae^{-az}$ for $Z > 0$ none		
8)	Sma a) c)	allest part of an neighbour pixels Pixel Kernel	is ca b) d)	alled as Pel Coefficient

B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

**Duration: 30 Minutes** 

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No.

Q.1

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

2) Assume suitable data wherever.

Choose the correct alternatives from the options.

#### **MCQ/Objective Type Questions**

**SLR-FM-262** 

Max. Marks: 70

Marks: 14

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			Set Q	
9)	Pixel having Euclidean distance fro radius centred at (x, y). a) Disk c) Square	m f(x b) d)	x,y) from a shape with Diamond Pyramid	
10)	YUV color models family are useful a) Display devices c) Color TV broadcasting	in _ b) d)	applications. Printing applications None	
11)	<ul> <li>s= c r<sup>v</sup>, where S-output grey level, r positive constant; means</li> <li>a) Negative</li> <li>c) Bit plane slicing</li> </ul>	-inpu b) d)	it grey level, c-positive constant, v- Log transform Power law	
12)	If number of storage bits are 52428  a) 256 x 256 c) 512 x 512	8 for b) d)	8-bit image, then size of image is 128 x 128 1024 x 1024	
13)	$\begin{array}{l} H(U,V)=1-e^{\frac{-D^2\left(U,V\right)}{2\sigma^2}} \text{ is equation} \\ \text{a)}  \text{Butterworth HPF} \\ \text{c)}  \text{Ideal HPF} \end{array}$	for _ b) d)	in frequency domain. Gaussian HPF None of these	
14)	Full color image means a) 8-bit c) 16-bit	b) d)	24-bit 4-bit	

#### B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING Day & Date: Tuesday, 17-12-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Attempt any Four.

Seat

No.

- a) Explain Image sampling and quantization.
- **b)** Explain the types of Log transformation.
- c) Explain types Low pass filters used for image smoothing.
- d) Explain Image opening and closing process with example.
- e) Draw intensity level slicing on 3 BPP image. Let  $r_1=3$  and  $r_2=5$ .

	,		0	
2	1	2	2	1
2	3	4	5	2
6	2	7	6	0
2	6	6	5	1
0	3	2	2	1

#### Q.3 Attempt any two.

- a) Explain K-L transform in details.
- b) Explain the following edge detection operators-
  - 1) Gradient operator
  - 2) Pewits' operator
  - 3) Soble operator
- c) Explain Regional Processing method for edge linking.

#### Section – II

#### Q.4 Attempt any Four.

- a) Explain Image degradation Model.
- **b)** Explain Sampling structure for Digital Video.
- c) Explain Principle of Color Video camera.
- d) Explain 3-D sampling.
- e) Explain Gaussian Noise and Rayleigh noise mode.

#### Q.5 Attempt any two.

- a) Explain Inverse Filter for image restoration.
- **b)** Explain 2-D rectangular sampling.
- c) Explain Optical flow equation.

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#### B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

256 x 256

Duration: 30 Minutes

a)

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

2) Assume suitable data wherever.

### MCQ/Objective Type Questions

#### Q.1 Choose the correct alternatives from the options.

If number of storage bits are 524288 for 8-bit image, then size of image is

b) 128 x 128

c) 512 x 512 d) 1024 x 1024 2)  $H(U,V) = 1 - e \frac{-D^2(U,V)}{2\sigma^2}$  is equation for \_\_\_\_\_ in frequency domain. a) Butterworth HPF b) Gaussian HPF d) None of these Ideal HPF C) Full color image means \_\_\_\_\_. 3) a) 8-bit b) 24-bit c) 16-bit d) 4-bit 4) The symbol  $\bigstar$  indicates \_\_\_\_\_. a) Correlation b) Convolution c) Multiplication d) None The equation  $Hi(U, V) = \frac{1}{H(U, V)}$  for \_\_\_\_\_ filter. 5) Inverse filter b) Pseudo-Inverse a) c) Weiner d) None Digital video can be obtained by sampling analog video in the 6) direction along the scan lines. a) Horizontal b) Vertical c) Ratsra d) None 2-D motion, also called \_\_\_\_\_. 7) b) Projected motion a) Rejected motion c) Optical flow motion d) None 8)  $\frac{\partial s_c(x;t)}{\partial x_1}v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2}v_2(x,t) + \frac{\partial s_c(x;t)}{\partial t} = 0 \quad \text{is called as } \_\_\_\_.$ a) Optical flow equation b) Motion estimation d) None c) optimization method The symbol (—) represents \_\_\_\_\_ operation. 9) a) Erosion b) Dilation Thinning d) Thickening C)

Seat No.

Max. Marks: 70

Marks: 14

Set R

10) The PDF of pepper and salt noise is represented by \_\_\_\_\_.

- a) P(z) = Pa for Z = a= Pb for Z = b= 0 otherwise
- $P(z) = \frac{1}{b-a} \text{ for } a < z < b$   $P(z) = ae^{-az} \text{ for } Z > 0$ b)
- C)
- d) none

a)

a)

11) Smallest part of an neighbour pixels is called as \_\_\_\_\_.

- Pixel b) Pel
- Kernel d) Coefficient c)
- Pixel having Euclidean distance from f(x,y) from a shape \_\_\_\_\_ with 12) radius centred at (x, y).
  - b) Diamond
  - Square d) Pyramid C)
- 13) YUV color models family are useful in \_\_\_\_\_ applications. a) Display devices
  - b) Printing applications
  - c) Color TV broadcasting d) None
- 14) s= c r<sup>v</sup>, where S-output grey level, r-input grey level, c-positive constant, vpositive constant; means \_\_\_\_\_.
  - a) Negative

Disk

- Bit plane slicing C)
- b) Log transform
- d) Power law

#### B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING Day & Date: Tuesday, 17-12-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM Instructions: 1) All questions are compulsory. 2) Figure to the right indicates full marks.

Section – I

#### Q.2 Attempt any Four.

Seat

No.

#### a) Explain Image sampling and quantization.

- **b)** Explain the types of Log transformation.
- c) Explain types Low pass filters used for image smoothing.
- d) Explain Image opening and closing process with example.
- e) Draw intensity level slicing on 3 BPP image. Let  $r_1=3$  and  $r_2=5$ .

	,		0	
2	1	2	2	1
2	3	4	5	2
6	2	7	6	0
2	6	6	5	1
0	3	2	2	1

#### Q.3 Attempt any two.

- a) Explain K-L transform in details.
- b) Explain the following edge detection operators-
  - 1) Gradient operator
  - 2) Pewits' operator
  - 3) Soble operator
- c) Explain Regional Processing method for edge linking.

#### Section – II

#### Q.4 Attempt any Four.

- a) Explain Image degradation Model.
- **b)** Explain Sampling structure for Digital Video.
- c) Explain Principle of Color Video camera.
- d) Explain 3-D sampling.
- e) Explain Gaussian Noise and Rayleigh noise mode.

#### Q.5 Attempt any two.

- a) Explain Inverse Filter for image restoration.
- **b)** Explain 2-D rectangular sampling.
- c) Explain Optical flow equation.

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Pixel Kernel	b) d)	Pel Coefficient		
I having Euclidean distance fron us centred at (x, y).	n f(x,	y) from a shape	with	
Disk	b)	Diamond		
Square	d)	Pyramid		
′ color models family are useful i Display devices Color TV broadcasting	n b) d)	applications. Printing applications None		
				Page <b>10</b> of <b>12</b>

		MCQ/Objective Type Questions	
Durat	ion: 3	30 Minutes	Marks: 14
Q.1	<b>Cho</b> 1)	oose the correct alternatives from the options.Digital video can be obtained by sampling analog video in thedirection along the scan lines.a) Horizontalb) Verticalc) Ratsrad) None	14
	2)	2-D motion, also calleda) Rejected motionb) Projected motionc) Optical flow motiond) None	
	3)	$\frac{\partial s_c(x;t)}{\partial x_1}v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2}v_2(x,t) + \frac{\partial s_c(x;t)}{\partial t} = 0  \text{is called as } \_\_\_\_$ a) Optical flow equation b) Motion estimation c) optimization method d) None	
	4)	The symbol — represents operation. a) Erosion b) Dilation c) Thinning d) Thickening	
	5)	The PDF of pepper and salt noise is represented by a) $P(z) = Pa$ for $Z = a$ = Pb for $Z = b= 0$ otherwise b) $P(z) = \frac{1}{b-a}$ for $a < z < b$ c) $P(z) = ae^{-az}$ for $Z > 0$ d) none	
	6)	Smallest part of an neighbour pixels is called as a) Pixel b) Pel c) Kernel d) Coefficient	
	7)	Pixel having Euclidean distance from f(x,y) from a shape with radius centred at (x, y).a) Diskb) Diamondc) Squared) Pyramid	
	8)	YUV color models family are useful in applications. a) Display devices b) Printing applications	

### Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

**Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING** 

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

2) Assume suitable data wherever.

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C)

### **SLR-FM-262**

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B.E. (Part -I) (New) (CBCS) Examination Nov/Dec-2019

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Max. Marks: 70

Set S

- $s=c r^{v}$ , where S-output grey level, r-input grey level, c-positive constant, v-9) positive constant; means \_\_\_\_\_.
  - Negative a) C)
- b) Log transform
  - Bit plane slicing d) Power law
- 10) If number of storage bits are 524288 for 8-bit image, then size of image is
  - 256 x 256 b) 128 x 128 a) c) 512 x 512 d) 1024 x 1024
  - $H(U, V) = 1 e \frac{-D^2(U, V)}{2\sigma^2}$  is equation for \_\_\_\_\_ in frequency domain.
  - a) Butterworth HPF
  - Ideal HPF C)

11)

- b) Gaussian HPF
- d) None of these
- 12) Full color image means \_\_\_\_\_. a) 8-bit b) 24-bit
  - c) 16-bit d) 4-bit
- 13) The symbol  $\bigstar$  indicates \_\_\_\_\_.
  - a) Correlation
  - c) Multiplication

- b) Convolution d) None
- 14) The equation  $Hi(U, V) = \frac{1}{H(U, V)}$  for \_\_\_\_\_ filter.
  - a) Inverse filter
  - Weiner c)

- b) Pseudo-Inverse
- d) None

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### B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE & VIDEO PROCESSING

Day & Date: Tuesday, 17-12-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Attempt any Four.

Seat

No.

- a) Explain Image sampling and quantization.
- **b)** Explain the types of Log transformation.
- c) Explain types Low pass filters used for image smoothing.
- d) Explain Image opening and closing process with example.
- e) Draw intensity level slicing on 3 BPP image. Let  $r_1=3$  and  $r_2=5$ .

	•		•	
2	1	2	2	1
2	3	4	5	2
6	2	7	6	0
2	6	6	5	1
0	3	2	2	1

#### Q.3 Attempt any two.

- a) Explain K-L transform in details.
- b) Explain the following edge detection operators-
  - 1) Gradient operator
  - 2) Pewits' operator
  - 3) Soble operator
- c) Explain Regional Processing method for edge linking.

#### Section – II

#### Q.4 Attempt any Four.

- a) Explain Image degradation Model.
   b) Explain Sampling structure for Digital Video
  - **b)** Explain Sampling structure for Digital Video.
  - c) Explain Principle of Color Video camera.
  - d) Explain 3-D sampling.
  - e) Explain Gaussian Noise and Rayleigh noise mode.

#### Q.5 Attempt any two.

- a) Explain Inverse Filter for image restoration.
- **b)** Explain 2-D rectangular sampling.
- c) Explain Optical flow equation.

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Max. Marks: 56

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#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** ADVANCED DSP

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.

### MCQ/Objective Type Questions

### **Duration: 30 Minutes**

Seat

No.

#### Q.1 Choose the correct alternatives from the options.

- To what value should the bandwidth of x(n) has to be reduced in order to 1) avoid aliasing?
  - a) F/D b) F/2D c) F/4D d) None of the mentioned
- The linear filtering operation followed by down sampling on x(n) is not 2) time invariant.
  - b) False a) True
- 3) Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?
  - a) Parallel b) Cascade
  - c) Convolution d) None of the mentioned
- Which of the following methods are used in sampling rate conversion of a 4) digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned
- 5) Which of the following is the disadvantage of sampling rate conversion by converting the signal into analog signal?
  - a) Signal distortion
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- 6) Power spectral density function is a \_\_\_\_ a) Real and even function
  - b) Non negative function
  - c) Periodic d) All of the mentioned
- Power spectrum describes distribution of \_\_\_\_\_ under frequency domain. 7)
  - Mean a) C)

- b) Variance
- Gaussian d) None of the mentioned



Max. Marks: 70

Marks: 14



- 8) According to Parseval's theorem the energy spectral density curve is equal to
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned
- 9) Autocorrelation function of periodic signal is equal to \_\_\_\_\_.
  - a) Energy of the signal
- b) Power of the signal
  - c) Its area in frequency domain d) None of the mentioned
- Autocorrelation function of white noise will have? 10)
  - a) Strong peak
  - b) Infinite peak d) None of the mentioned c) Weak peak
- Rate of convergence is defined by \_ of algorithm. 11)
  - b) Number of iterations
  - a) Time span c) Accuracy
- d) Complexity
- Computational complexity is a measure of \_\_\_\_\_
- a) Time

12)

c)

b) Number of iterations

d) Accuracy

- Number of operations
- 13) Which of the following is a method for implementing a FIR system?
  - Direct form a)

- b) Cascade form
- Lattice structure d) All of the mentioned c)
- In IIR Filter design by the Bilinear Transformation, the Bilinear 14) Transformation is a mapping from \_
  - a) Z-plane to S-plane
- b) S-plane to Z-plane
- c) S-plane to J-plane
- d) J-plane to Z-plane

#### B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

#### Section – I

#### Q.2 Attempt any two.

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$

= 0 otherwise

Find the values for h(n) for N=7.

- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. C)

#### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. c)

#### Section – II

#### Q.4 Attempt any two. 14 Explain LMS algorithm used in adaptive filters. a) Explain power spectrum estimation using parametric method. b) Write a note on wavelet transform. c) Attempt any two. 14 Q.5 Explain MUSIC algorithm used for spectrum estimation. a) Explain application of adaptive filter for noise cancellation. b)

c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Max. Marks: 56

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#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

2) Figures to the right indicate full marks.

### MCQ/Objective Type Questions

#### Q.1 Choose the correct alternatives from the options.

- According to Parseval's theorem the energy spectral density curve is 1) equal to .
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned

#### 2) Autocorrelation function of periodic signal is equal to \_\_\_\_\_

- a) Energy of the signal b) Power of the signal
- Its area in frequency domain d) None of the mentioned C)
- 3) Autocorrelation function of white noise will have?
  - a) Strong peak b) Infinite peak
  - c) Weak peak d) None of the mentioned
- 4) Rate of convergence is defined by \_\_\_\_ \_ of algorithm.
  - a) Time span Number of iterations b)
    - c) Accuracy d) Complexity
- Computational complexity is a measure of 5) b) Number of iterations
  - a) Time
  - c) Number of operations
- Which of the following is a method for implementing a FIR system? 6)

d) Accuracy

- a) Direct form b) Cascade form
- c) Lattice structure d) All of the mentioned
- In IIR Filter design by the Bilinear Transformation, the Bilinear 7) Transformation is a mapping from \_
  - a) Z-plane to S-plane b) S-plane to Z-plane c) S-plane to J-plane d) J-plane to Z-plane
  - To what value should the bandwidth of x(n) has to be reduced in order to
- 8) avoid aliasing?
  - b) F/2D a) F/D c) F/4D d) None of the mentioned
- 9) The linear filtering operation followed by down sampling on x(n) is not time invariant.
  - a) True b) False

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Max. Marks: 70

Set Q

- 10) Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?
  - a) Parallel

b) Cascade

c) Convolution

- d) None of the mentioned
- 11) Which of the following methods are used in sampling rate conversion of a digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned
- 12) Which of the following is the disadvantage of sampling rate conversion by converting the signal into analog signal?
  - a) Signal distortion
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- 13) Power spectral density function is a \_
  - a) Real and even functionc) Periodic
- b) Non negative function
- d) All of the mentioned
- 14) Power spectrum describes distribution of \_\_\_\_\_ under frequency domain.
  - a) Mean
  - c) Gaussian

b) Varianced) None of the mentioned

#### B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

#### Section – I

#### Q.2 Attempt any two.

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$

= 0 otherwise

Find the values for h(n) for N=7.

- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. C)

#### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. c)

#### Section – II

#### Q.4 Attempt any two. 14 Explain LMS algorithm used in adaptive filters. a) Explain power spectrum estimation using parametric method. b) Write a note on wavelet transform. c) Attempt any two. Q.5 Explain MUSIC algorithm used for spectrum estimation. a)

- Explain application of adaptive filter for noise cancellation. b)
- c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Seat No.

### **SLR-FM-265**

Set

Max. Marks: 56

14

14

#### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Seat No.

#### Q.1 Choose the correct alternatives from the options.

- Which of the following is the disadvantage of sampling rate conversion by 1) converting the signal into analog signal?
  - Signal distortion a)
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- Power spectral density function is a 2) b) Non negative function
  - a) Real and even function
  - Periodic d) All of the mentioned c)
- 3) Power spectrum describes distribution of \_\_\_\_\_ under frequency domain.
  - b) Variance a) Mean c) Gaussian d) None of the mentioned
- 4) According to Parseval's theorem the energy spectral density curve is equal to .
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned
- 5) Autocorrelation function of periodic signal is equal to
  - b) Power of the signal a) Energy of the signal
  - c) Its area in frequency domain d) None of the mentioned
- Autocorrelation function of white noise will have? 6)
  - a) Strong peak b) Infinite peak
  - c) Weak peak d) None of the mentioned
- 7) Rate of convergence is defined by \_ of algorithm.
  - a) Time span b) Number of iterations d) Complexity
  - c) Accuracy
- Computational complexity is a measure of \_ 8) b) Number of iterations
  - a) Time
  - Number of operations d) Accuracy C)

### SLR-FM-265

Max. Marks: 70

Marks: 14

Set R

- 9) Which of the following is a method for implementing a FIR system?
  - a) Direct form

- b) Cascade form
- c) Lattice structure d) All of the mentioned
- 10) In IIR Filter design by the Bilinear Transformation, the Bilinear Transformation is a mapping from \_\_\_\_\_.
  - a) Z-plane to S-plane b) S-plane to Z-plane
  - c) S-plane to J-plane d) J-plane to Z-plane
- 11) To what value should the bandwidth of x(n) has to be reduced in order to avoid aliasing?
  - a) F/D
- b) F/2D
- c) F/4D d) None of the mentioned
- 12) The linear filtering operation followed by down sampling on x(n) is not time invariant.
  - a) True b) False
- 13) Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?
  - a) Parallel

- b) Cascade
- c) Convolution d) None of the mentioned
- 14) Which of the following methods are used in sampling rate conversion of a digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned

### No. B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

#### Section – I

#### Q.2 Attempt any two.

Seat

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$

= 0 otherwise

- Find the values for h(n) for N=7.
- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. C)

#### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. c)

#### Section – II

#### Q.4 Attempt any two. 14 Explain LMS algorithm used in adaptive filters. a) Explain power spectrum estimation using parametric method. b) Write a note on wavelet transform. c) Attempt any two. Q.5 Explain MUSIC algorithm used for spectrum estimation. a) Explain application of adaptive filter for noise cancellation. b)

c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Set

**SLR-FM-265** 

Max. Marks: 56

14

14

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

c) Weak peak

**Duration: 30 Minutes** 

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.

### MCQ/Objective Type Questions

#### Q.1 Choose the correct alternatives from the options.

- Autocorrelation function of white noise will have? 1)
  - b) Infinite peak Strong peak a)
    - d) None of the mentioned
- 2) Rate of convergence is defined by \_ of algorithm.
  - a) Time span b) Number of iterations
  - d) Complexity c) Accuracy

#### 3) Computational complexity is a measure of \_\_\_\_\_

- a) Time b) Number of iterations
- c) Number of operations d) Accuracy
- 4) Which of the following is a method for implementing a FIR system?
  - a) Direct form b) Cascade form
  - c) Lattice structure d) All of the mentioned
- 5) In IIR Filter design by the Bilinear Transformation, the Bilinear Transformation is a mapping from \_
  - a) Z-plane to S-plane
  - S-plane to Z-plane c) S-plane to J-plane d) J-plane to Z-plane
- To what value should the bandwidth of x(n) has to be reduced in order to 6) avoid aliasing?

b)

- b) F/2D a) F/D
- c) F/4D d) None of the mentioned
- 7) The linear filtering operation followed by down sampling on x(n) is not time invariant.
  - a) True b) False
- Sampling rate conversion by the rational factor I/D is accomplished by 8) what connection of interpolator and decimator?
  - a) Parallel c) Convolution
- b) Cascade d) None of the mentioned

SLR-FM-265



Max. Marks: 70

Seat No.

14

Marks: 14

Set S

- 9) Which of the following methods are used in sampling rate conversion of a digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned
- 10) Which of the following is the disadvantage of sampling rate conversion by converting the signal into analog signal?
  - a) Signal distortion
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- 11) Power spectral density function is a \_

a) Real and even function

- b) Non negative function
- c) Periodic d) All of the mentioned
- 12) Power spectrum describes distribution of \_\_\_\_\_ under frequency domain.
  - a) Mean
- b) Variance
- c) Gaussian d) None of the mentioned
- According to Parseval's theorem the energy spectral density curve is equal to \_\_\_\_\_.
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned
- 14) Autocorrelation function of periodic signal is equal to \_\_\_\_
  - a) Energy of the signal
- b) Power of the signal
- c) Its area in frequency domain d) None of the mentioned

## Set

### B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ADVANCED DSP

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.

### Section – I

#### Q.2 Attempt any two.

Seat

No.

- a) Design an ideal low pass filter with a frequency response.
  - $H_d(e^{jw}) = 1 \text{ for } 0 \le |w| \le \pi/4$ = 0 otherwise

Find the values for h(n) for N=7.

- **b)** Explain digital filter banks with polyphase structures.
- c) Explain FIR Wiener filter for filtering and prediction.

#### Q.3 Attempt any two.

- a) Draw the direct form II structure for the system.
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- **b)** Explain Sampling rate conversion using interpolation and decimation.
- c) Explain AR and ARMA model.

#### Section – II

#### Q.4 Attempt any two.

- a) Explain LMS algorithm used in adaptive filters.
- b) Explain power spectrum estimation using parametric method.
- c) Write a note on wavelet transform.

#### Q.5 Attempt any two.

- a) Explain MUSIC algorithm used for spectrum estimation.
- b) Explain application of adaptive filter for noise cancellation.
- c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Max. Marks: 56

**SLR-FM-265** 

14

14

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14

et S
Time	e: 02.3	80 PM To 05.30 PM		max. marks.	10
Instr	ructio	<b>ns:</b> 1) Q. No. 1 is compulsory. It sho book.	ould be	solved in first 30 minutes in answer	
		<ul><li>2) Figures to the right indicate for</li><li>3) Assume suitable data if nece</li></ul>	ull mari ssary.	ks.	
		MCQ/Objective	Туре	Questions	
Dura	ation: 3	30 Minutes		Marks:	14
Q.1	<b>Cho</b> 1)	ose the correct alternatives from The topology requires multipoint c	the op	tions and rewrite the sentence.	14
		a) Star c) Ring	b) d)	Mesn Bus	
	2)	In this topology there is a central of a) Star c) Ring	ontrolle b) d)	er or hub Mesh Bus	
	3)	The physical layer is responsible f next. a) segments c) bits	or mov b) d)	ing from one (node) to the Frames Datagram	
	4)	Which one of the following task is a) framing c) flow control	not doi b) d)	ne by data link layer? error control channel coding	
	5)	The address space of IPV4 is a) 2 <sup>32</sup> c) 2 <sup>8</sup>	b) d)	2 <sup>16</sup> None of these	
	6)	The port number 1011 is po a) registered	ort num b)	iber. well-known	

## **Electronics & Telecommunication Engineering** COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday.07-12-2019 Tir

Seat No. B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

## **SLR-FM-266**

Max. Marks: 70

dynamic c) d) none of these

7) is an example of connectionless simple protocol.

- IP TCP a) b) UDP d) None of these C)
- Which protocol does Ping use? 8)
- TCP a)
  - b) ARP c) ICMP d) **BootP**
- Which of the following devices is a PC component that connects the 9) computer to the network?
  - a) Bridge NIC b)
  - **DNS Server** d) Gateway c)

Ρ

Set

Set P To deliver a message to the correct application program running on a 10) host, the \_\_\_\_\_ address must be consulted. a) IP MAC b) c) Port d) None of the above 11) The time taken by a packet to travel from client to server and then back to the client is called \_\_\_\_\_ b) RTT a) STT c) PTT d) None of the these Mode of data transfer in FTP, using protocol is \_\_\_\_ 12) . a) Stream mode b) Block mode d) c) Compressed mode None of these The DHCP server can provide the \_\_\_\_\_ of the IP addresses. 13) a) dynamic allocation b) automatic allocation c) static allocation all of these d)

- 14) Header size of the ICMP message is \_\_\_\_\_
  - a) 8-bytes
  - c) 16-bytes

- b) 8-bits
- d) 16-bits

**SLR-FM-266** 

Set

## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

## Q.2 Attempt any three:

Seat

No.

- a) Write difference between TCP and UDP.
- **b**) Explain in short Media Access Control.
- c) Draw and explain 3 topologies along with it's advantages and disadvantages.
- d) Draw and explain hamming code error detection technique.
- e) With a neat sketch explain mode transition in HDLC.

### Q.3 Attempt any two:

- a) Explain the working of stop and wait flow control and Sliding window flow control. Comment on the channel utilization in both the cases.
- **b)** Explain concept of subnetting with one example. Also write about special IP addresses.
- c) With the help of neat sketch explain connection establishment, data transfer and connection termination phases of TCP.

## Section – II

## Q.4 Attempt any three:

- a) Explain in short RARP and BOOTP protocols.
- **b)** Explain in short ICMP query messages.
- c) Explain various name spaces used in DNS.
- d) Explain how connection is established in FTP for file transfer.
- e) Explain in short shortest path routing.

### Q.5 Attempt any two.

- a) Draw and explain DHCP packet format.
- **b)** Explain architecture of Email using four scenarios which includes user agents (UA), Message Transfer agents (MTA) and Message Access Agents (MAA).
- c) What is count to infinity problem in distance vector routing? Give it's solution.

Max. Marks: 56

12

12

16

# B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Saturday,07-12-2019

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.

COMPUTER COMMUNICATION NETWORK

- 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 and rewrite the sentence. 14

- 1) Which protocol does Ping use?
  - a) TCP ARP b) c) ICMP d) **BootP**
- 2) Which of the following devices is a PC component that connects the computer to the network? b) NIC
  - a) Bridge
  - **DNS Server** d) c) Gateway
- 3) To deliver a message to the correct application program running on a host, the address must be consulted.
  - a) IP MAC b)
  - c) Port d) None of the above
- 4) The time taken by a packet to travel from client to server and then back to the client is called \_\_\_\_\_ b) RTT
  - a) STT
    - c) PTT d) None of the these
- Mode of data transfer in FTP, using protocol is 5)
  - a) Stream mode Block mode b)
  - c) Compressed mode d) None of these
- The DHCP server can provide the of the IP addresses. 6)
  - a) dynamic allocation automatic allocation b)
  - c) static allocation d) all of these
- 7) Header size of the ICMP message is
  - a) 8-bytes b) 8-bits
  - c) 16-bytes d) 16-bits
- 8) The topology requires multipoint connection
  - a) Star b) Mesh Ring d) Bus c)
- 9) In this topology there is a central controller or hub \_\_\_\_\_.
  - Star Mesh a) b)
  - Ring c) d) Bus

Max. Marks: 70

Marks: 14

**SLR-FM-266** Set Q

- Set Q
- 10) The physical layer is responsible for moving \_\_\_\_\_ from one (node) to the next.
  - a) segments b) Frames
  - c) bits d) Datagram
- 11) Which one of the following task is not done by data link layer?
  - a) framing b) error control
  - c) flow control d) channel coding
- The address space of IPV4 is \_\_\_\_\_. 12)
  - 2<sup>16</sup> a) 2<sup>32</sup> c) 2<sup>8</sup>
  - d) None of these
- The port number 1011 is \_\_\_\_\_ port number. 13)
  - a) registered b) well-known
  - c) dynamic d) none of these
- 14) \_\_\_\_ is an example of connectionless simple protocol.
  - a) IP TCP b)
  - c) UDP d) None of these

## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

## Q.2 Attempt any three:

Seat No.

- a) Write difference between TCP and UDP.
- **b**) Explain in short Media Access Control.
- c) Draw and explain 3 topologies along with it's advantages and disadvantages.
- d) Draw and explain hamming code error detection technique.
- e) With a neat sketch explain mode transition in HDLC.

### Q.3 Attempt any two:

- a) Explain the working of stop and wait flow control and Sliding window flow control. Comment on the channel utilization in both the cases.
- **b)** Explain concept of subnetting with one example. Also write about special IP addresses.
- c) With the help of neat sketch explain connection establishment, data transfer and connection termination phases of TCP.

## Section – II

## Q.4 Attempt any three:

- a) Explain in short RARP and BOOTP protocols.
- **b)** Explain in short ICMP query messages.
- c) Explain various name spaces used in DNS.
- d) Explain how connection is established in FTP for file transfer.
- e) Explain in short shortest path routing.

## Q.5 Attempt any two.

- a) Draw and explain DHCP packet format.
- **b)** Explain architecture of Email using four scenarios which includes user agents (UA), Message Transfer agents (MTA) and Message Access Agents (MAA).
- c) What is count to infinity problem in distance vector routing? Give it's solution.



16

12

16

# B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Saturday,07-12-2019 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 suitable data if necessary.

## **MCQ/Objective Type Questions**

COMPUTER COMMUNICATION NETWORK

**Duration: 30 Minutes** 

Seat

No.

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

- 1) The address space of IPV4 is
  - 2<sup>16</sup> 2<sup>32</sup> b) a) 2<sup>8</sup> c) d) None of these
- 2) The port number 1011 is \_\_\_\_\_ port number.
  - a) registered well-known b) c)
    - dynamic d) none of these
- 3) is an example of connectionless simple protocol.
  - TCP a) IP b) UDP d) None of these c)
- Which protocol does Ping use? 4)
  - a) TCP ARP b)
  - c) ICMP **BootP** d)
- Which of the following devices is a PC component that connects the 5) computer to the network? NIC b)
  - a) Bridge
  - c) DNS Server d) Gateway
- To deliver a message to the correct application program running on a 6) host, the address must be consulted.
  - MAC a) IP b)
  - d) None of the above c) Port
- 7) The time taken by a packet to travel from client to server and then back to the client is called \_\_\_\_\_ a) STT b)

RTT

- None of the these c) PTT d)
- 8) Mode of data transfer in FTP, using protocol is \_\_\_\_\_
  - a) Stream mode Block mode b) c) Compressed mode d) None of these
- 9) The DHCP server can provide the \_\_\_\_\_ of the IP addresses.
  - dynamic allocation b) automatic allocation a)
  - c) static allocation all of these d)

**SLR-FM-266** 



Set

R

Max. Marks: 70

Marks: 14

			Set
10)	Header size of the ICMP message i a) 8-bytes	s b) d)	 8-bits 16-bits
11)	The topology requires multipoint cor a) Star c) Ring	nnecti b) d)	on Mesh Bus
12)	In this topology there is a central co a) Star c) Ring	ntrolle b) d)	er or hub Mesh Bus
13)	The physical layer is responsible for next. a) segments	r movi b)	ng from one (node) to the Frames

- c) bits Datagram d)
- 14) Which one of the following task is not done by data link layer? error control
  - b)
  - a) framingc) flow control d) channel coding

R

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R

## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Day & Date: Saturday,07-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

COMPUTER COMMUNICATION NETWORK

## Q.2 Attempt any three:

Seat

No.

- a) Write difference between TCP and UDP.
- **b**) Explain in short Media Access Control.
- c) Draw and explain 3 topologies along with it's advantages and disadvantages.
- d) Draw and explain hamming code error detection technique.
- e) With a neat sketch explain mode transition in HDLC.

### Q.3 Attempt any two:

- a) Explain the working of stop and wait flow control and Sliding window flow control. Comment on the channel utilization in both the cases.
- **b)** Explain concept of subnetting with one example. Also write about special IP addresses.
- c) With the help of neat sketch explain connection establishment, data transfer and connection termination phases of TCP.

### Section – II

## Q.4 Attempt any three:

- a) Explain in short RARP and BOOTP protocols.
- **b)** Explain in short ICMP query messages.
- c) Explain various name spaces used in DNS.
- d) Explain how connection is established in FTP for file transfer.
- e) Explain in short shortest path routing.

### Q.5 Attempt any two.

- a) Draw and explain DHCP packet format.
- **b)** Explain architecture of Email using four scenarios which includes user agents (UA), Message Transfer agents (MTA) and Message Access Agents (MAA).
- c) What is count to infinity problem in distance vector routing? Give it's solution.

Max. Marks: 56

12

16

12

## Set B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019

**Electronics & Telecommunication Engineering** COMPUTER COMMUNICATION NETWORK Day & Date: Saturday,07-12-2019

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 suitable 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) To deliver a message to the correct application program running on a host, the address must be consulted.
  - a) IP c) Port
- 2) The time taken by a packet to travel from client to server and then back to the client is called \_\_\_\_\_
  - a) STT b) RTT
  - c) PTT d) None of the these

Mode of data transfer in FTP, using protocol is 3)

- a) Stream mode b) Block mode c) Compressed mode d) None of these
- 4) The DHCP server can provide the \_\_\_\_ of the IP addresses.
  - a) dynamic allocation b) automatic allocation
    - c) static allocation d) all of these
- Header size of the ICMP message is 5) 8-bits 8-bytes b) a)
  - 16-bytes d) 16-bits c)
- The topology requires multipoint connection 6)
  - Star b) Mesh a) Ring d) Bus C)
- 7) In this topology there is a central controller or hub .
  - Star Mesh b) a) c)
    - Ring d) Bus
- 8) The physical layer is responsible for moving \_\_\_\_\_ from one (node) to the next.
  - a) segments b) Frames c) bits d) Datagram
- 9) Which one of the following task is not done by data link layer?
  - framing a) c) flow control

- error control b)
- d) channel coding



Marks: 14

- MAC
- d) None of the above

- b)

10)	The address space of IPV4 is a) 2 <sup>32</sup> c) 2 <sup>8</sup>	b) d)	2 <sup>16</sup> None of these
11)	The port number 1011 is port a) registered c) dynamic	t num b) d)	ber. well-known none of these
12)	<ul> <li> is an example of connectionle</li> <li>a) IP</li> <li>c) UDP</li> </ul>	ess si b) d)	mple protocol. TCP None of these
13)	Which protocol does Ping use? a) TCP c) ICMP	b) d)	ARP BootP
		20	

#### Which of the following devices is a PC component that connects the 14) computer to the network?

- a) Bridgec) DNS Server
- b) NIC
- Gateway d)

SLR-FM-266

Set S

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Max. Marks: 56

## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Time: 02.30 PM To 05.30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

## Section – I

## Q.2 Attempt any three:

Seat

No.

- a) Write difference between TCP and UDP.
- b) Explain in short Media Access Control.
- c) Draw and explain 3 topologies along with it's advantages and disadvantages.
- d) Draw and explain hamming code error detection technique.
- e) With a neat sketch explain mode transition in HDLC.

## Q.3 Attempt any two:

- a) Explain the working of stop and wait flow control and Sliding window flow control. Comment on the channel utilization in both the cases.
- **b)** Explain concept of subnetting with one example. Also write about special IP addresses.
- c) With the help of neat sketch explain connection establishment, data transfer and connection termination phases of TCP.

## Section – II

## Q.4 Attempt any three:

- a) Explain in short RARP and BOOTP protocols.
- b) Explain in short ICMP query messages.
- c) Explain various name spaces used in DNS.
- d) Explain how connection is established in FTP for file transfer.
- e) Explain in short shortest path routing.

## Q.5 Attempt any two.

- a) Draw and explain DHCP packet format.
- **b)** Explain architecture of Email using four scenarios which includes user agents (UA), Message Transfer agents (MTA) and Message Access Agents (MAA).
- c) What is count to infinity problem in distance vector routing? Give it's solution.

12

16

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## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering VLSI DESIGN**

Day & Date: Tuesday, 10-12-2019 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.

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

a)

Seat

No.

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

b)

Procedure

d) none of these

b) Variable

Parallel

d) None of the above

All of the above

- 1) Variables in VHDL can be used in
- Function c) d) The power dissipation of CMOS IC will 2)
  - a) increase with frequency

Process

- b) decrease with frequency both a and b C)
- Which among the following is a process of transforming design entry 3) information of the circuit into a set of logic equations?
  - a) Simulation b) Optimization
  - Synthesis d) Verification c)
- In VHDL which object is used to connect entities together for the model 4) formation?
  - a) Constant
  - Signal d) All of the above c)
- For Complex gate design in CMOS, OR function needs to be implemented 5) by \_

b)

- Series a)
- Both series and parallel c)
- In enhancement MOSFET, the magnitude of output current due to 6) an increase in the magnitude of the gate potential.
  - b) remains constant a) increases
  - c) decreases d) none of the above
- In concurrent code which of the statements can be used? 7)
  - b) Generate Statement a) When else statement
  - c) Block statement d) All of the above
- To test AND gate for stuck- at-1 we apply to the input being tested 8) and to other input.
  - a) 0 and 1 b) 1 and 0
  - 1 and 1 d) 0 and 0 c)
- The CPLD contains several PAL-type simple programmable logic devices 9) (SPLDs) called \_\_\_\_\_
  - a) Macrocell
  - AND/OR arrays C)
- b) Microcell
- d) Fuse-link arrays

SLR-FM-267

Marks: 14



Max. Marks: 70

Set P

- 10) Propagation delay is more in \_\_\_\_\_ than \_\_\_\_\_
  - a) FPGA, CPLD b) CPLD, FPGA
  - c) Can't say d) None of these
- 11) In XC 9500 one macrocell can have maximum \_\_\_\_\_ product terms.
  - a) 72 b) 36
  - c) 90 d) 18
- 12) To detect N bit sequence using Moore machine, the number of states required is \_\_\_\_\_.
  - a) 2N b) N+1 c) N-1 d) 2N-1
- 13) In which of the following programming method is used for FPGA?
  - a) SRAMb) Fuseboth a and bd) none of these
  - A) In Magne singuite the system denomination of
- 14) In Moore circuits, the output depends on \_\_\_\_\_
  - a) Present statec) Inputs

- b) Present state and input
- d) None of these

## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering VLSI DESIGN Day & Date: Tuesday, 10-12-2019 Max. Marks: 56

Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

## Section – I

## Q.2 Answer any Four.

Seat

No.

- a) Design a VHDL module for BCD to 7 segment decoder.
- **b)** With the help of DC characteristics explain operation of CMOS inverter.
- c) Realize the Boolean expression Y= [A (B+C)]' using CMOS logic.
- d) Compare signal, variable and constant in VDHL.
- e) Explain WAIT statements in VHDL.

## Q.3 Answer any Two.

- a) 1) Derive the expression for dynamic power dissipation in CMOS inverter.
  - 2) Calculate dynamic power dissipation in CMOS inverter when VDD= 3.3 V, C=10 pF, F=100 MHz.
- **b)** Write a VHDL code to realize 4 X 4 Array multiplier.
- c) With example explain generic and generate statement in VHDL.

## Section – II

## Q.4 Answer any Four.

- a) Draw Macrocell and explain its working.
- **b)** With example explain testing of Combinational logic.
- c) Write a test bench for 4: 2 encoder.
- d) How Built-In Self-Test is used to check ICs?
- e) Draw state diagram and write VHDL code for T flip flop.

### Q.5 Answer any Two.

- a) Explain in detail different architectures of FPGA.
- **b)** Draw state diagram and write VHDL code to realize Coffee vending machine.
- c) Draw state diagram and write VHDL code for ADD and SHIFT multiplier.

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Set F

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## Set B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering VLSI DESIGN**

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 05:30 PM

book.

		2) Figures to the right indicates fu	ıll m	arks.	
		MCQ/Objective Ty	/pe (	Questions	
Dura	tion: 3	30 Minutes		Marks:	14
Q.1	<b>Cho</b> 1)	To test AND gate for stuck- at-1 we and to other input. and to other input. a) 0 and 1 c) 1 and 1	n <b>e o</b> appl b) d)	<pre>ptions and rewrite the sentence. y to the input being tested 1 and 0 0 and 0</pre>	14
	2)	The CPLD contains several PAL-typ (SPLDs) called a) Macrocell c) AND/OR arrays	e sir b) d)	mple programmable logic devices Microcell Fuse-link arrays	
	3)	Propagation delay is more in a) FPGA, CPLD c) Can't say	than b) d)	CPLD, FPGA None of these	
	4)	In XC 9500 one macrocell can have a) 72 c) 90	max b) d)	kimum product terms. 36 18	
	5)	To detect N bit sequence using Moo required is a) 2N c) N-1	b) d)	nachine, the number of states N+1 2N-1	
	6)	In which of the following programmir a) SRAM c) both a and b	ng m b) d)	ethod is used for FPGA? Fuse none of these	
	7)	In Moore circuits, the output depend a) Present state	s on b) d)	 Present state and input None of these	
	8)	Variables in VHDL can be used in a) Process	b)	Procedure	

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

#### 9) The power dissipation of CMOS IC will \_

- increase with frequency a)
- both a and b c)

Function

C)

decrease with frequency b) d) none of these

All of the above

d)

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Seat No.

Max. Marks: 70

Q

Set Q

- 10) Which among the following is a process of transforming design entry information of the circuit into a set of logic equations?
  - Simulation a)

b) Optimization

c) Synthesis

- d) Verification
- 11) In VHDL which object is used to connect entities together for the model formation?
  - a) Constant

- b) Variable
- Signal d) All of the above C)
- 12) For Complex gate design in CMOS, OR function needs to be implemented by \_\_\_\_ .
  - Series a)

- b) Parallel
- d) None of the above c) Both series and parallel
- 13) In enhancement MOSFET, the magnitude of output current \_\_\_\_\_ due to an increase in the magnitude of the gate potential.
  - a) increases b) remains constant c) decreases
    - d) none of the above
- 14) In concurrent code which of the statements can be used?
  - a) When else statement
- b) Generate Statement
- c) Block statement
- d) All of the above

## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering VLSI DESIGN

Day & Date: Tuesday, 10-12-2019

Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

## Section – I

## Q.2 Answer any Four.

Seat

No.

- a) Design a VHDL module for BCD to 7 segment decoder.
- **b)** With the help of DC characteristics explain operation of CMOS inverter.
- c) Realize the Boolean expression Y= [A (B+C)]' using CMOS logic.
- d) Compare signal, variable and constant in VDHL.
- e) Explain WAIT statements in VHDL.

## Q.3 Answer any Two.

- a) 1) Derive the expression for dynamic power dissipation in CMOS inverter.
  - 2) Calculate dynamic power dissipation in CMOS inverter when VDD= 3.3 V, C=10 pF, F=100 MHz.
- **b)** Write a VHDL code to realize 4 X 4 Array multiplier.
- c) With example explain generic and generate statement in VHDL.

## Section – II

## Q.4 Answer any Four.

- a) Draw Macrocell and explain its working.
- **b)** With example explain testing of Combinational logic.
- c) Write a test bench for 4: 2 encoder.
- d) How Built-In Self-Test is used to check ICs?
- e) Draw state diagram and write VHDL code for T flip flop.

## Q.5 Answer any Two.

- a) Explain in detail different architectures of FPGA.
- **b)** Draw state diagram and write VHDL code to realize Coffee vending machine.
- c) Draw state diagram and write VHDL code for ADD and SHIFT multiplier.

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Max. Marks: 56

12

Instr	uctio	ns: ´	1) Q. No. 1 is compuls	ory and should	be solved in first 30 minutes in answ	/er
		2	2) Figures to the right	indicates full m	arks.	
			MCQ/O	bjective Type	Questions	
Dura	tion: 3	30 M	inutes		Marks:	: 14
Q.1	<b>Cho</b> 1)	ose For by	the correct alternation Complex gate design	ves from the o in CMOS, OR	ptions and rewrite the sentence. function needs to be implemented	14
		a) c)	Series Both series and para	b) allel d)	Parallel None of the above	
	2)	In e an a) c)	enhancement MOSFE increase in the magnit increases decreases	T, the magnitud tude of the gate b) d)	de of output current due to potential. remains constant none of the above	
	3)	In c a) c)	concurrent code which When else statemer Block statement	of the stateme t b) d)	nts can be used? Generate Statement All of the above	
	4)	To anc a) c)	test AND gate for stud I to other input. 0 and 1 1 and 1	k- at-1 we appl b) d)	ly to the input being tested 1 and 0 0 and 0	
	5)	The (SF a) c)	e CPLD contains seve PLDs) called Macrocell AND/OR arrays	ral PAL-type sin b) d)	mple programmable logic devices Microcell Fuse-link arrays	
	6)	Pro a) c)	pagation delay is mor FPGA, CPLD Can't say	e in thar b) d)	CPLD, FPGA None of these	
	7)	In ≯ a) c)	(C 9500 one macroce 72 90	ll can have max b) d)	kimum product terms. 36 18	
	8)	To req a) c)	detect N bit sequence uired is 2N N-1	using Moore m b) d)	nachine, the number of states N+1 2N-1	
	9)	ln v a) c)	vhich of the following   SRAM both a and b	orogramming m b) d)	nethod is used for FPGA? Fuse none of these	

Seat No.

## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering VLSI DESIGN**

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

Marks: 14

14

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- 10) In Moore circuits, the output depends on \_\_\_\_\_
  - a) Present state
  - c) Inputs

- b) Present state and input
- d) None of these
- 11) Variables in VHDL can be used in \_
  - a) Processc) Function

- b) Procedure
- d) All of the above
- 12) The power dissipation of CMOS IC will \_a) increase with frequency b)
  - b) decrease with frequency
  - c) both a and b
- decrease with frequer d) none of these
- 13) Which among the following is a process of transforming design entry information of the circuit into a set of logic equations?
  - a) Simulation b) Optimization
  - c) Synthesis d) Verification
  - 14) In VHDL which object is used to connect entities together for the model formation?
    - a) Constant
    - c) Signal

- b) Variable
- d) All of the above

## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering VLSI DESIGN** Max. Marks: 56 2) Figure to the right indicates full marks. Section – I Q.2 Answer any Four.

- Design a VHDL module for BCD to 7 segment decoder. a)
- With the help of DC characteristics explain operation of CMOS inverter. b)
- Realize the Boolean expression Y= [A (B+C)]' using CMOS logic. C)
- Compare signal, variable and constant in VDHL. d)
- Explain WAIT statements in VHDL. e)

### Q.3 Answer any Two.

- 1) Derive the expression for dynamic power dissipation in CMOS a) inverter.
  - Calculate dynamic power dissipation in CMOS inverter when 2) VDD= 3.3 V. C=10 pF. F=100 MHz.
- Write a VHDL code to realize 4 X 4 Array multiplier. b)
- With example explain generic and generate statement in VHDL. C)

### Section – II

### Q.4 Answer any Four.

- Draw Macrocell and explain its working. a)
- With example explain testing of Combinational logic. b)
- Write a test bench for 4: 2 encoder. C)
- How Built-In Self-Test is used to check ICs? d)
- Draw state diagram and write VHDL code for T flip flop. e)

#### Q.5 Answer any Two.

- Explain in detail different architectures of FPGA. a)
- Draw state diagram and write VHDL code to realize Coffee vending b) machine.
- Draw state diagram and write VHDL code for ADD and SHIFT multiplier. c)

Seat

No.

Day & Date: Tuesday, 10-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

# Set

**SLR-FM-267** 

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			Electronics & Telecomm VLSI DE	unio SIG	cation Engineering
Day Time	& Date e: 02:3	e: Tue 80 PM	esday, 10-12-2019 To 05:30 PM		Max. Marks: 70
Inst	ructio	ns: 1)	Q. No. 1 is compulsory and sh book.	ould III m	be solved in first 30 minutes in answer
		<i>_</i> )	MCQ/Objective Tv	vpe	Questions
Dura	ation: 3	30 Mir	nutes	/	Marks: 14
Q.1	<b>Cho</b> 1)	o <b>se tl</b> Prop a) c)	he correct alternatives from the agation delay is more in FPGA, CPLD Can't say	h <b>e o</b> thar b) d)	ptions and rewrite the sentence. 14 CPLD, FPGA None of these
	2)	In X( a) c)	C 9500 one macrocell can have 72 90	max b) d)	timum product terms. 36 18
	3)	To d requ a) c)	etect N bit sequence using Moc ired is 2N N-1	bre m b) d)	achine, the number of states N+1 2N-1
	4)	In wł a) c)	nich of the following programmiı SRAM both a and b	ng m b) d)	ethod is used for FPGA? Fuse none of these
	5)	In M a) c)	oore circuits, the output depend Present state Inputs	ls on b) d)	Present state and input None of these
	6)	Varia a) c)	ables in VHDL can be used in _ Process Function	b) d)	 Procedure All of the above
	7)	The a) c)	power dissipation of CMOS IC v increase with frequency both a and b	will _ b) d)	decrease with frequency none of these
	8)	Whic infor a) c)	ch among the following is a proc mation of the circuit into a set o Simulation Synthesis	cess f logi b) d)	of transforming design entry c equations? Optimization Verification
	9)	In Vł form a)	HDL which object is used to cor ation? Constant	nect b)	entities together for the model Variable

Seat No. B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

## **SLR-FM-267**

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- c) Signal

- d) All of the above



- For Complex gate design in CMOS, OR function needs to be implemented 10) by \_\_\_
  - Series a)

a)

a)

- b) Parallel
- Both series and parallel C)
- d) None of the above
- In enhancement MOSFET, the magnitude of output current \_\_\_\_\_ due to 11) an increase in the magnitude of the gate potential.
  - increases b) remains constant
  - d) none of the above decreases c)
- In concurrent code which of the statements can be used? 12)
  - When else statement b) Generate Statement
  - d) All of the above c) Block statement
- 13) To test AND gate for stuck- at-1 we apply \_\_\_\_\_ to the input being tested and \_\_\_\_\_ to other input.
  - a) 0 and 1 b) 1 and 0
  - c) 1 and 1 d) 0 and 0
- The CPLD contains several PAL-type simple programmable logic devices 14) (SPLDs) called \_\_\_\_\_.
  - a) Macrocell
  - c) AND/OR arrays
- b) Microcell
- d) Fuse-link arrays

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		B.E. (Part – I Electron	l) (Old) (CGPA) Examination Nov/Dec- ics & Telecommunication Engineerin VLSI DESIGN	2019 g	
Day a Time	& Da : 02::	te: Tuesday, 10-1 30 PM To 05:30 F	2-2019 PM	Max. Marks	s: 56
Instr	uctio	ons: 1) All questic 2) Figure to t	ons are compulsory. the right indicates full marks.		
			Section – I		
Q.2	Ans a) b) c) d) e)	swer any Four. Design a VHDL With the help of Realize the Boo Compare signal Explain WAIT st	module for BCD to 7 segment decoder. DC characteristics explain operation of CMOS lean expression Y= [A (B+C)]' using CMOS log , variable and constant in VDHL. ratements in VHDL.	inverter. jic.	16
Q.3	Ans a) b) c)	<ul> <li>Swer any Two.</li> <li>1) Derive the end inverter.</li> <li>2) Calculate dy VDD= 3.3 V</li> <li>Write a VHDL co With example example example</li> </ul>	expression for dynamic power dissipation in CN ynamic power dissipation in CMOS inverter wh /, C=10 pF, F=100 MHz. ode to realize 4 X 4 Array multiplier. xplain generic and generate statement in VHDL Section – II	1OS en 	12
04	۸nc	wer any Four			16
<b>Q.4</b>	a) b) c) d) e)	Draw Macrocell With example ex Write a test bene How Built-In Sel Draw state diag	and explain its working. xplain testing of Combinational logic. ch for 4: 2 encoder. f-Test is used to check ICs? ram and write VHDL code for T flip flop.		10
Q.5	Ans a) b)	swer any Two. Explain in detail Draw state diagi machine.	different architectures of FPGA. ram and write VHDL code to realize Coffee ver	nding	12

c) Draw state diagram and write VHDL code for ADD and SHIFT multiplier.

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## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SATELLITE COMMUNICATION

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 Page No.3

- 2) Each question carries one mark.
- 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) Calculate the radius of a circular orbit for which the period is 1 day?
  - a) 42.241Km b) 42.241m
  - 4.241Km 2.241Km C) d)
- 2) What is application of satellite systems?
  - a) Whether forecasting **Terrestrial communication** b) None of the above
  - c) Point to point communication d)
- Atmospheric drag has negligible effect on 3)
  - MEO a) Geostationary satellites b) c) LEO d) None of these
- 4) The down link frequency in the C band transponder is \_\_\_\_\_.
  - a) 6 GHz 4 GHz b)
  - c) 14 GHz d) 11 GHz
- A satellite downlink at 12GHz operates with a transmit power of 6w & an 5) antenna gain of 48.2db. Calculate the EIRP in dBw.
  - a) 56dBw 16dBw b)
  - c) 48dBw d) None of above
- A 20 meter antenna gives a certain up-link gain at 5 GHz. For getting the 6) same gain at 25 GHz ate antenna size required will be .
  - a) 100 m b) 80 m 4 m
  - c) 20 m d)
- 7) Satellite receives signal from
  - a) Microwave repeater stations TV relay station b)
    - c) Appropriate earth station All of the above d)
- 8) The Broadcast Satellite services (BSS) uses a) One way Implementation
  - b) Split Two- way Implementation
  - c) Two-Way Implementation None of these d)
- 9) A satellite may carry \_\_\_\_\_ transponders.
  - 32 41 a) b)
  - 24 None of these c) d)

Max. Marks: 70

Marks: 14

**SLR-FM-268** 



- 10) Which area is least effectively covered by geostationary satellites?
  - a) Equatorial region c) a and b
- b) Polar region None of the above d)
- satellites will provide universal broadband Internet access. 11)
  - a) GPS

- b) Iridium
- c) Teledesic d) none of the above
- A satellite earth station has \_ 12)
  - a) Receiving facilities only
  - c) a and b

- b) Transmitting only
- a, c and attenuating d)
- MATV stands for \_\_\_\_\_. 13)
  - a) Master antenna TV (MATV)
  - c) Multi amplitude TV
- Maximum Angular TV b)
- None of these d)
- The 24-MHz bandwidth of a transponder is capable of carrying \_ 14) a) One analog television channel
  - \_\_\_-Two analog television channel b)

Set P

Four analog television channel None of these c) d)

Seat	
No.	

## B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section - I

## Q.2 Solve any Two:

- a) Explain in detail Launch and Launch Vehicles.
- **b)** Describe different subsystems used in satellite.
- c) Derive the expression for system noise temperature & G/T ratio.

## Q.3 Solve any Two:

- a) What do you mean by look angle determination and orbital perturbation? Explain.
- **b)** With the help of block diagram, comment on Telemetry, Tracking & Command (TT & C) subsystem of satellite.
- c) Explain the process of Ku band uplink design.

## Section - II

## Q.4 Solve any Two:

- a) With the help of block diagram, explain Earth Station Architecture.
- **b)** Compare Elliptical orbits & Sun-synchronous orbit.
- c) Discuss the concept of GPS time in detail.

## Q.5 Solve any Two:

- a) Comment on R.F equipment for Earth station and Earth Station Testing.
- **b)** Explain Coverage & frequency consideration.
- c) With the help of neat diagram, explain the working of DBS-TV Receiver.



Max. Marks: 56

14

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## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SATELLITE COMMUNICATION

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 Page No.3

- 2) Each question carries one mark.
- 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. 14

b)

b)

None of these

Maximum Angular TV

None of these

- 1) The Broadcast Satellite services (BSS) uses Split Two- way Implementation
  - a) One way Implementation
  - c) Two-Way Implementation d)
- 2) A satellite may carry \_\_\_\_\_ transponders.
  - 41 a) 32 b) c) 24
    - d) None of these
- Which area is least effectively covered by geostationary satellites? 3)
  - a) Equatorial region Polar region b)
    - c) a and b None of the above d)
- 4) satellites will provide universal broadband Internet access. GPS a)
  - Iridium b)
  - c) Teledesic d) none of the above
- 5) A satellite earth station has
  - Transmitting only a) Receiving facilities only b) a, c and attenuating d)
  - c) a and b
- 6) MATV stands for \_\_\_\_\_.
  - a) Master antenna TV (MATV)
  - c) Multi amplitude TV d)
- 7) The 24-MHz bandwidth of a transponder is capable of carrying
  - a) One analog television channel Two analog television channel b)
  - Four analog television channel None of these d) c)
- Calculate the radius of a circular orbit for which the period is 1 day? 8)
  - a) 42.241Km 42.241m b)
  - c) 4.241Km d) 2.241Km
- 9) What is application of satellite systems?
  - a) Whether forecasting **Terrestrial communication** b)
    - c) Point to point communication None of the above d)
- 10) Atmospheric drag has negligible effect on b)
  - a) Geostationary satellites
  - c) LEO
- MEO
- d) None of these

Max. Marks: 70

Marks: 14

Set Q

- The down link frequency in the C band transponder is \_\_\_\_\_. 11)
  - a) 6 GHz
- b) 4 GHz
- c) 14 GHz 11 GHz d)
- A satellite downlink at 12GHz operates with a transmit power of 6w & an 12) antenna gain of 48.2db. Calculate the EIRP in dBw.
  - a) 56dBw 16dBw b) c) 48dBw
    - d) None of above
- A 20 meter antenna gives a certain up-link gain at 5 GHz. For getting the 13) same gain at 25 GHz ate antenna size required will be \_\_\_\_\_.
  - a) 100 m 80 m b)
  - c) 20 m 4 m d)
- Satellite receives signal from \_ 14)
  - a) Microwave repeater stations b) TV relay station
  - c) Appropriate earth station
- All of the above d)

Seat	
No.	

## B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section - I

### Q.2 Solve any Two:

- a) Explain in detail Launch and Launch Vehicles.
- **b)** Describe different subsystems used in satellite.
- c) Derive the expression for system noise temperature & G/T ratio.

## Q.3 Solve any Two:

- a) What do you mean by look angle determination and orbital perturbation? Explain.
- **b)** With the help of block diagram, comment on Telemetry, Tracking & Command (TT & C) subsystem of satellite.
- c) Explain the process of Ku band uplink design.

### Section - II

## Q.4 Solve any Two:

- a) With the help of block diagram, explain Earth Station Architecture.
- **b)** Compare Elliptical orbits & Sun-synchronous orbit.
- c) Discuss the concept of GPS time in detail.

## Q.5 Solve any Two:

- a) Comment on R.F equipment for Earth station and Earth Station Testing.
- **b)** Explain Coverage & frequency consideration.
- c) With the help of neat diagram, explain the working of DBS-TV Receiver.



Max. Marks: 56

14

14

14

Set

R

Seat	
No.	

## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SATELLITE COMMUNICATION

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 Page No.3

- 2) Each question carries one mark.
- 3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

**Duration: 30 Minutes** 

8)

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

- A satellite downlink at 12GHz operates with a transmit power of 6w & an 1) antenna gain of 48.2db. Calculate the EIRP in dBw.
  - a) 56dBw b) 16dBw
  - c) 48dBw d) None of above
- 2) A 20 meter antenna gives a certain up-link gain at 5 GHz. For getting the same gain at 25 GHz ate antenna size required will be \_\_\_\_\_. a) 100 m 80 m b) c) 20 m d) 4 m

#### Satellite receives signal from 3)

- a) Microwave repeater stations TV relay station b)
- All of the above c) Appropriate earth station d)

#### 4) The Broadcast Satellite services (BSS) uses \_

- Split Two- way Implementation a) One way Implementation b) None of these d)
- c) Two-Way Implementation
- A satellite may carry \_\_\_\_\_ transponders. 5)
  - a) 32 b) 41 c) 24 d) None of these
- Which area is least effectively covered by geostationary satellites? 6)
  - a) Equatorial region b) Polar region
  - c) a and b None of the above d)
- 7) satellites will provide universal broadband Internet access.
  - a) GPS Iridium b)
  - c) Teledesic d) none of the above
  - A satellite earth station has \_\_\_\_\_ a) Receiving facilities only b) Transmitting only
    - c) a and b a, c and attenuating d)

#### 9) MATV stands for

- a) Master antenna TV (MATV) Maximum Angular TV b)
- c) Multi amplitude TV None of these d)
- The 24-MHz bandwidth of a transponder is capable of carrying \_ 10) a) One analog television channel
  - Two analog television channel b)
  - c) Four analog television channel None of these d)

Max. Marks: 70

Marks: 14

Calculate the radius of a circular orbit for which the period is 1 day? 11)

- a) 42.241Km b) c) 4.241Km
- 42.241m 2.241Km
  - d)
- What is application of satellite systems? 12)
  - a) Whether forecasting
  - c) Point to point communication
- b) Terrestrial communication
- d) None of the above
- Atmospheric drag has negligible effect on \_ 13) b)
  - a) Geostationary satellites
  - c) LEO
- MEO d) None of these
- The down link frequency in the C band transponder is \_\_\_\_\_. 14)
  - a) 6 GHz

- 4 GHz b)
- 11 GHz d)

Page **8** of **12** 

**SLR-FM-268** 

## Set R

- c) 14 GHz

Seat	
No.	

## B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section - I

### Q.2 Solve any Two:

- a) Explain in detail Launch and Launch Vehicles.
- **b)** Describe different subsystems used in satellite.
- c) Derive the expression for system noise temperature & G/T ratio.

## Q.3 Solve any Two:

- a) What do you mean by look angle determination and orbital perturbation? Explain.
- **b)** With the help of block diagram, comment on Telemetry, Tracking & Command (TT & C) subsystem of satellite.
- c) Explain the process of Ku band uplink design.

## Section - II

## Q.4 Solve any Two:

- a) With the help of block diagram, explain Earth Station Architecture.
- **b)** Compare Elliptical orbits & Sun-synchronous orbit.
- c) Discuss the concept of GPS time in detail.

## Q.5 Solve any Two:

- a) Comment on R.F equipment for Earth station and Earth Station Testing.
- **b)** Explain Coverage & frequency consideration.
- c) With the help of neat diagram, explain the working of DBS-TV Receiver.

Set R

Max. Marks: 56

14

14

14

# Set

## B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SATELLITE COMMUNICATION

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 Page No.3

- 2) Each question carries one mark.
- 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) Which area is least effectively covered by geostationary satellites? Polar region
  - a) Equatorial region
    - c) a and b None of the above d)

b)

b)

b)

Transmitting only a, c and attenuating

Maximum Angular TV

**Terrestrial communication** 

- 2) satellites will provide universal broadband Internet access.
  - GPS Iridium b) a)
  - c) Teledesic d) none of the above
- 3) A satellite earth station has
  - a) Receiving facilities only b)
  - c) a and b d)
- 4) MATV stands for \_\_\_\_\_.
  - a) Master antenna TV (MATV)
  - c) Multi amplitude TV d) None of these
- 5) The 24-MHz bandwidth of a transponder is capable of carrying \_
  - Two analog television channel a) One analog television channel b) None of these
  - c) Four analog television channel d)
- Calculate the radius of a circular orbit for which the period is 1 day? 6)
  - a) 42.241Km 42.241m b)
  - c) 4.241Km d) 2.241Km

#### What is application of satellite systems? 7)

- a) Whether forecasting
- Point to point communication None of the above d) c)
- Atmospheric drag has negligible effect on 8)
  - a) Geostationary satellites MEO b) LEO d) None of these c)
- 9) The down link frequency in the C band transponder is \_\_\_\_\_
  - a) 6 GHz b) 4 GHz
  - c) 14 GHz 11 GHz d)
- 10) A satellite downlink at 12GHz operates with a transmit power of 6w & an antenna gain of 48.2db. Calculate the EIRP in dBw.
  - a) 56dBw
  - c) 48dBw

- b) 16dBw
- d) None of above

Marks: 14

Max. Marks: 70



Set

S

A 20 meter antenna gives a certain up-link gain at 5 GHz. For getting the same gain at 25 GHz ate antenna size required will be \_\_\_\_\_.

41

- a) 100 m b) 80 m
- c) 20 m d) 4 m
- 12) Satellite receives signal from

11)

- a) Microwave repeater stations b) TV relay station
- c) Appropriate earth station All of the above d)
- The Broadcast Satellite services (BSS) uses \_ 13)
  - -. Split Two- way Implementation b)
  - a) One way Implementation c) Two-Way Implementation d) None of these
- A satellite may carry \_\_\_\_\_ transponders. 14)
  - a) 32
  - b) c) 24 d) None of these

## B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Time: 02.30 PM To 05.30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section - I

## Q.2 Solve any Two:

- a) Explain in detail Launch and Launch Vehicles.
- **b)** Describe different subsystems used in satellite.
- c) Derive the expression for system noise temperature & G/T ratio.

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- a) What do you mean by look angle determination and orbital perturbation? Explain.
- **b)** With the help of block diagram, comment on Telemetry, Tracking & Command (TT & C) subsystem of satellite.
- c) Explain the process of Ku band uplink design.

## Section - II

## Q.4 Solve any Two:

- a) With the help of block diagram, explain Earth Station Architecture.
- **b)** Compare Elliptical orbits & Sun-synchronous orbit.
- c) Discuss the concept of GPS time in detail.

## Q.5 Solve any Two:

- a) Comment on R.F equipment for Earth station and Earth Station Testing.
- b) Explain Coverage & frequency consideration.
- c) With the help of neat diagram, explain the working of DBS-TV Receiver.



Max. Marks: 56

14

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Seat <u>No.</u>										Set	Ρ
		B.E	E. (Part – I) Electronio	(Old) (CGF cs & Telecc CODII	PA) Exan ommunio NG THE	nir cat OR	nation tion Er RY	Nov/De ngineeri	c-2019 ng		
Day & Time:	Date 02:30	e: Sat D PM	urday, 14-12 To 05:30 PM	-2019 1					Мах	. Marks	3: 70
Instru	ictior	n <b>s:</b> 1) 2) 3)	) Q. No. 1 is o Book. ) Figures to th ) Assume sui	compulsory ar ne right indica table data if n	nd should te full mar ecessary.	be ˈks	solved i	in first 30	minutes	in answ	er
			М	CQ/Obiecti	eqvT ev	Q	uestio	ns			
Durati	ion: 3	0 Mir	nutes							Marks	5: 14
Q.1	Choo	ose ti	he correct al	Iternatives fro	om the op	otic	ons.				14
	1)	The	weight of co	de 1101101 is	;		_				
		a) c)	6 4		b) d)		5 3				
	2)	A bo box and a)	ox contains 4 successively third is black 5/35	white and 3 b . What is the ?	olack balls probability b)	. Tl ' th	hree bal at the fi 3/35	lls are dra rst two ba	wn from Ils are wl	the nite	
		c)	2/25		d)		6/35				
	3)	The situa a) c)	starting poin ation before t extreme rig middle	t on the code he arrival of th ht	tree is at t ne first me b) d)	he ssa	age bit. extrement none of	and corre e left f these	sponds to	o the	
	4)	The a) c)	redundancy n / k n-k / n	of (n,k) code i	is defined b) d)	as	 k / n n-k / k				
	5)	For a) c)	double error 5 3	correction the	minimum b) d)	di	stance r 4 2	equired is	S		
	6)	In co mod size a) c)	onvolution co lulo-2 adders will be 68 48	de encoder w is 4. For an ir 	ith a six st nput data : b) d)	tag stre	e shift r eam of { 52 44	egister, th 5 bits, the	ne numbe code wo	er of ord	
	7)	The metl a) c)	sequential d hod for k = 6. 128 21	ecoding meth	, od is b) d)	t	imes fa 25 12	ster than	the exha	ustive	
	8)	lt is with	sometimes c the help of g	onvenient to r jeometric diag	epresent a rams know	a u wn	niversal as	set, sets  agram	and sub	sets	

u)	Olalo diagram	<b>D</b> )	nee alagiam
c)	Venn diagram	d)	Trellis diagram

Seat No.

	SLR-FM-269
	Set P
9)	<ul> <li>The total area under the probability distribution curve is</li> <li>a) 1</li> <li>b) Depends on the nature of distribution</li> <li>c) 0</li> <li>d) None of the above</li> </ul>
10)	The convolutional encoder in terms of its, is the response of theencoder to a single one bit that moves through it.a) real time responseb) responsec) impulse responsed) none of these
11)	<ul> <li>The stationary process has</li> <li>a) Ensemble average equal to time average</li> <li>b) all the statistical properties dependent on time</li> <li>c) all the statistical properties independent on time</li> <li>d) zero variance</li> </ul>
12)	The tree diagram adds the dimensions of to the state diagram. a) Time b) Branches c) Direction d) Weight
13)	For each $(k \ge n)$ generator matrix G, there exists an matrix P. a) $(n-k) \ge k$ c) $k \ge (n-k)$ d) $(n-k) \ge n$
14)	<ul> <li>A random variable that takes on a finite number of values is known as a</li> <li>a) Continuous random variable</li> <li>b) Discrete random variable</li> <li>c) both a and b</li> <li>d) None of these</li> </ul>

Seat No.

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering CODING THEORY

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### Section – I

#### Q.2 Attempt any four

- a) In a factory 4 machine A1, A2, A3 & A4 produce 10%, 20%, 30% & 40% of the items respectively. The % of defective items produced by them is 5%, 4%, 3%, 2% respectively. An item selected at random is found to be defective, What is the probability that it was produced by machine A2.
- **b)** State & prove Baye's theorem.
- c) How error detection & correction is done in linear block code? Explain it with suitable example.
- d) What is standard array? How it is useful in decoding linear block code?
- e) The generator polynomial of (6, 3) cyclic code  $g(x)=1+x^2$ . Find all code words using non systematic method.

#### Q.3 Attempt any two

- a) The parity check matrix for (7,4) block code is given by [1 0 1 0 1 0 0]
  - $\mathbf{H} = \begin{bmatrix} 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$

Draw the decoder.

**b)** The joint probability function of two random variables X and Y is given by  $f(x, y) = c(x^2 + 2y)$  x = 0,1,2, y = 1,2,3,4

= 0 otherwise

Find:

- 1) Value of C
- 2) P(X = 2, Y = 3)
- 3)  $P(X \le 1, Y > 2)$

c) Define the following terms with respect to random processes.

- 1) Stationarity
- 2) Time average
- 3) Ergodic process

#### Section – II

#### Q.4 Attempt any four

- a) Explain different types of interleavers.
- **b)** With suitable example, explain polynomial representation of convolution coding.
- c) Define
  - 1) Coding gain
  - 2) Catastrophic error propagation, of convolution coding
- d) Explain in brief about turbo encoder.
- e) Explain add compare select computation used in decoder implementation of convolutional decoder.

Max. Marks: 56

Set

12

16

12

#### Q.5 Attempt any two

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.



Fig 1

- **b)** With example explain inpulse response representation technique to convolution coding.
- c) Draw trellis diagram for convolution coder given in Fig 1 for input data 11010

		3)	) Assume suitable data if necess	sary.		
			MCQ/Objective T	ype (	Questions	
ura	tion: 3	30 Mir	nutes		Mark	s: 14
.1	<b>Cho</b> 1)	ose t It is with a) c)	he correct alternatives from the sometimes convenient to represe the help of geometric diagrams State diagram Venn diagram	ne opt sent a know b) d)	<b>ions.</b> universal set, sets and subsets n as Tree diagram Trellis diagram	14
	2)	The a) b) c) d)	total area under the probability 1 Depends on the nature of distr 0 None of the above	distrib ibutior	ution curve is	
	3)	The enco a) c)	convolutional encoder in terms oder to a single one bit that mov real time response impulse response	of its _ es thro b) d)	, is the response of the ough it. response none of these	
	4)	The a) b) c) d)	stationary process has Ensemble average equal to tin all the statistical properties dep all the statistical properties ind zero variance	ne ave bender epend	rage ht on time ent on time	
	5)	The a) c)	tree diagram adds the dimension Time Direction	ons of b) d)	to the state diagram. Branches Weight	
	6)	For a) c)	each (k x n) generator matrix G (n-k) x k k x (n – k)	there b) d)	exists an matrix P. k x n (n – k) x n	
	7)	A ra a) c)	ndom variable that takes on a fi Continuous random variable both a and b	nite nu b) d)	Imber of values is known as a Discrete random variable None of these	<u> </u>
	8)	The a)	weight of code 1101101 is6	 b)	5	

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

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CODING THEORY** 

- 2) Figures to the right indicate full marks.

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Day & Date: Saturday, 14-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

### Q

Page **5** of **16** 

## **SLR-FM-269**

Max. Marks: 70

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				Set	Q
9)	A bo box and a)	ox contains 4 white and 3 black ba successively. What is the probab third is black? 5/35	alls. ⊺ ility tl b)	Three balls are drawn from the hat the first two balls are white 3/35	
	c)	2/25	d)	6/35	
10)	The situa a) c)	starting point on the code tree is ation before the arrival of the first extreme right middle	at the mess b) d)	e and corresponds to the sage bit. extreme left none of these	
11)	The a) c)	redundancy of (n,k) code is defin n / k n-k / n	ied a: b) d)	s k / n n-k / k	
12)	For a) c)	double error correction the minim 5 3	um d b) d)	istance required is 4 2	
13)	In co mod size	onvolution code encoder with a si lulo-2 adders is 4. For an input da will be	x stag ata st	ge shift register, the number of ream of 5 bits, the code word	
	a) c)	68 48	b) d)	52 44	
14)	The met	sequential decoding method is _ hod for k = 6.		times faster than the exhaustive	
	a)	128	b)	25	

 a)
 120
 b)
 25

 c)
 21
 d)
 12

SLR-FM-269

Set

Seat No.

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering CODING THEORY

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

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- **b)** State & prove Baye's theorem.
- c) How error detection & correction is done in linear block code? Explain it with suitable example.
- d) What is standard array? How it is useful in decoding linear block code?
- e) The generator polynomial of (6, 3) cyclic code  $g(x)=1+x^2$ . Find all code words using non systematic method.

#### Q.3 Attempt any two

- a) The parity check matrix for (7,4) block code is given by [1010100]
  - $\mathbf{H} = \begin{bmatrix} 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$

Draw the decoder.

b) The joint probability function of two random variables X and Y is given by  $f(x, y) = c(x^2 + 2y)$  x = 0,1,2, y = 1,2,3,4

= 0 otherwise

Find:

- 1) Value of C
- 2) P(X = 2, Y = 3)
- 3)  $P(X \le 1, Y > 2)$

c) Define the following terms with respect to random processes.

- 1) Stationarity
- 2) Time average
- 3) Ergodic process

#### Section – II

#### Q.4 Attempt any four

- a) Explain different types of interleavers.
- **b)** With suitable example, explain polynomial representation of convolution coding.
- c) Define
  - 1) Coding gain
  - 2) Catastrophic error propagation, of convolution coding
- d) Explain in brief about turbo encoder.
- e) Explain add compare select computation used in decoder implementation of convolutional decoder.

12

16

#### Q.5 Attempt any two

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.



Fig 1

- **b)** With example explain inpulse response representation technique to convolution coding.
- c) Draw trellis diagram for convolution coder given in Fig 1 for input data 11010

		B.E	. (Part – I) (Old) (CGPA) Ex Electronics & Telecommu CODING TH	kami inica IEOI	nation Nov/Dec-2019 ition Engineering RY
Day & Time	& Date : 02:30	: Sati ) PM	urday, 14-12-2019 To 05:30 PM		Max. Marks: 70
Instr	uction	i <b>s:</b> 1) 2)	Q. No. 1 is compulsory and sho Book. Figures to the right indicate full	uld be marks	e solved in first 30 minutes in answer s.
		3)		ary. V <b>ne C</b>	Juestions
Durat	tion: 3	0 Min	utes	heg	Marks: 14
Q.1	Choc 1)	<b>se th</b> For c a) c)	<b>ne correct alternatives from the</b> double error correction the minim 5 3	<b>e opti</b> ium d b) d)	ons. 14 istance required is 4 2
	2)	In cc mod size a) c)	onvolution code encoder with a si ulo-2 adders is 4. For an input da will be 68 48	b) d) d)	ge shift register, the number of eam of 5 bits, the code word 52 44
	3)	The meth a) c)	sequential decoding method is _ nod for k = 6. 128 21	b) d)	times faster than the exhaustive 25 12
	4)	It is s with a) c)	sometimes convenient to represe the help of geometric diagrams l State diagram Venn diagram	ent a u knowr b) d)	universal set, sets and subsets as Tree diagram Trellis diagram
	5)	The a) b) c) d)	total area under the probability d 1 Depends on the nature of distrik 0 None of the above	istribu oution	ution curve is
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### Seat No.

## SLR-FM-269

Set R

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8)	The a) c)	tree diagram adds the dimension Time Direction	b) d)	to the state diagram. Branches Weight	
9)	For e a) c)	each (k x n) generator matrix G, t (n-k) x k k x (n – k)	here ( b) d)	exists an matrix P. k x n (n – k) x n	
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14)	The a) c)	redundancy of (n,k) code is defin n / k n-k / n	ed as b) d)	s k / n n-k / k	

Seat No.

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering CODING THEORY

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

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#### Section – I

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Draw the decoder.

**b)** The joint probability function of two random variables X and Y is given by  $f(x, y) = c(x^2 + 2y)$  x = 0,1,2, y = 1,2,3,4

= 0 otherwise

Find:

- 1) Value of C
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#### Section – II

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- **b)** With suitable example, explain polynomial representation of convolution coding.
- c) Define
  - 1) Coding gain
  - 2) Catastrophic error propagation, of convolution coding
- d) Explain in brief about turbo encoder.
- e) Explain add compare select computation used in decoder implementation of convolutional decoder.

Max. Marks: 56

Set

12

16

12

#### Q.5 Attempt any two

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.



Fig 1

- **b)** With example explain inpulse response representation technique to convolution coding.
- c) Draw trellis diagram for convolution coder given in Fig 1 for input data 11010

		MCQ/Objective Ty	pe C	uestions	
ation: 3	80 Minu	utes	•	Marks	: 1
<b>Choo</b> 1)	ose the The c encoo a) c)	e correct alternatives from the convolutional encoder in terms of der to a single one bit that move real time response impulse response	e opti of its _ es thro b) d)	ons. , is the response of the ough it. response none of these	1
2)	The s a) b) c) d)	stationary process has Ensemble average equal to tim all the statistical properties dep all the statistical properties inde zero variance	e ave ender pende	rage it on time ent on time	
3)	The t a) c)	ree diagram adds the dimension Time Direction	ns of _ b) d)	to the state diagram. Branches Weight	
4)	For e a) c)	ach (k x n) generator matrix G, (n-k) x k k x (n – k)	there b) d)	exists an matrix P. k x n (n – k) x n	
5)	A ran a) c)	dom variable that takes on a fir Continuous random variable both a and b	iite nu b) d)	mber of values is known as a Discrete random variable None of these	•
6)	The v a) c)	veight of code 1101101 is 6 4	 b) d)	5 3	
7)	A box box s and tl a) c)	c contains 4 white and 3 black b uccessively. What is the probat hird is black? 5/35 2/25	alls. T bility th b) d)	Three balls are drawn from the nat the first two balls are white 3/35 6/35	
8)	The s situat a) c)	starting point on the code tree is ion before the arrival of the first extreme right middle	at the mess b) d)	and corresponds to the age bit. extreme left none of these	

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.

**Electronics & Telecommunication Engineering CODING THEORY** 

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

Dur

## Q.1

Page **13** of **16** 

## **SLR-FM-269**

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Set

Max. Marks: 70

4

4

No. B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Saturday, 14-12-2019

Seat

Set S

9)	The	redundancy of (n,k) code is define	ed as	6		
	a)	n / k	b)	k/n		
	c)	n-k / n	d)	n-k / k		
10)	For o	double error correction the minim	um di	istance required is		
,	a)	5	b)	4		
	c)	3	d)	2		
11)	In co mod size	onvolution code encoder with a six ulo-2 adders is 4. For an input da will be	k stag ta str	ge shift register, the number of eam of 5 bits, the code word		
	a)	68	b)	52		
	c)	48	d)	44		
12)	The meth	sequential decoding method is nod for k = 6.		times faster than the exhaustive		
	a)	128	b)	25		
	c)	21	d)	12		
13)	It is sometimes convenient to represent a universal set, sets and subsets with the help of geometric diagrams known as a) State diagram b) Tree diagram c) Venn diagram d) Trellis diagram					
14)	The	total area under the probability di	stribu	ition curve is		
	a)	1				
	b)	Depends on the nature of distrib	ution			
	c)	0				
	d)	None of the above				
	,					

Seat No.

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering CODING THEORY

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### Section – I

#### Q.2 Attempt any four

- a) In a factory 4 machine A1, A2, A3 & A4 produce 10%, 20%, 30% & 40% of the items respectively. The % of defective items produced by them is 5%, 4%, 3%, 2% respectively. An item selected at random is found to be defective, What is the probability that it was produced by machine A2.
- **b)** State & prove Baye's theorem.
- c) How error detection & correction is done in linear block code? Explain it with suitable example.
- d) What is standard array? How it is useful in decoding linear block code?
- e) The generator polynomial of (6, 3) cyclic code  $g(x)=1+x^2$ . Find all code words using non systematic method.

#### Q.3 Attempt any two

- a) The parity check matrix for (7,4) block code is given by [1010100]
  - $\mathbf{H} = \begin{bmatrix} 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$

Draw the decoder.

**b)** The joint probability function of two random variables X and Y is given by  $f(x, y) = c(x^2 + 2y)$  x = 0,1,2, y = 1,2,3,4

= 0 otherwise

Find:

- 1) Value of C
- 2) P(X = 2, Y = 3)
- 3)  $P(X \le 1, Y > 2)$

c) Define the following terms with respect to random processes.

- 1) Stationarity
- 2) Time average
- 3) Ergodic process

#### Section – II

#### Q.4 Attempt any four

- a) Explain different types of interleavers.
- **b)** With suitable example, explain polynomial representation of convolution coding.
- c) Define
  - 1) Coding gain
  - 2) Catastrophic error propagation, of convolution coding
- d) Explain in brief about turbo encoder.
- e) Explain add compare select computation used in decoder implementation of convolutional decoder.

Max. Marks: 56

Set

12

16

## Set S

#### Q.5 Attempt any two

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.



Fig 1

- **b)** With example explain inpulse response representation technique to convolution coding.
- c) Draw trellis diagram for convolution coder given in Fig 1 for input data 11010

Day Time	& Date : 02:3	e: Tu 0 P <b>i</b>	uesday,17-12-2019 M To 05:30 PM		Max. Marks: 70				
Instr	uctior	าร: '	<ol> <li>Q. No. 1 is compulsory and sh book.</li> <li>2) Figures to the right indicate ful</li> </ol>	ould b	be solved in first 30 minutes in answer				
		4							
Dura	tion: 3	0 M	inutes	pe c	Marks: 14				
Q 1	Choc	Se	the correct alternatives from th	e onti	ions 14				
<b>_</b>	1)	D4	distance is called as	o opu					
	,	a) c)	Euclidean distance Chess board distance	b) d)	City block distance None				
	2)	The	e neighbors of a pixel p(x, y) are g	given b	by (x + 1, Y+ 1), (x+ 1, y-1), (x-1, y-1),				
		(x- a)	4-neighbors	b)	diagonal neighbors				
		c)	8-neighbors	d)	None				
	3)	C№	IYK color model is useful in	•					
		a)	Display devices	b)	Printing applications				
		C)	Human color descriptor	a)	None				
	4)	S =	<ul> <li>L-I-r, where s = olp gray level an Image pagative</li> </ul>	idr=i	/p gray level; means				
		а) С)	Power law	d)	Log				
	5)	Imp	oulse noise is also called as	<i>.</i>	C .				
	,	a) <sup>'</sup>	Salt and Paper noise	b)	Uniform noise				
		c)	Gaussian noise	d)	None				
	6)	Exp	panding the object size is nothing	but _					
		a)	Erosion	b)	Dilation				
	7)	C)	tement 1. A median filter is affect	u) ivo in					
	()	in a	Statement 1: A median filter is effective in minimizing salt and paper holse in an image.						
		Sta	Statement 2: A median filter is a linear filter.						
		a)	Statement 1 is true whereas Sta	atemei	nt 2 is wrong				
		b)	Statement 1 I and 2 is true						
		d)	Statement 1 is false whereas St	ent 2 is true					
	8)	Ŵr	ich is the image processing techr	nique (	used to improve the quality of				
	-,	ima	age for human viewing?						
		a)	compression	b)	Enhancement				
		C)	restoration	d)	Analysis				

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE PROCESSING

## **SLR-FM-271**

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9) Which type of enhancement operations are used to modify pixel values according to the value of the pixel 's neighbors?

- a) Point operations
- b) local operations
- c) global operations
- d) Mask operations

**SLR-FM-271** 

Set P

- 10) Which device is used to capture the fingerprint pattern?
  - a) Capture device b) Fingerprint sensor
  - c) 2d sensor d) Digital sensor
- 11) Which of the following is a lossy coding?
  - a) Huffman code
  - b) Run-length code
  - c) Uniform code
  - d) Predictive coding without quantiser

12) The transform used in JPEG image Compression is \_\_\_\_\_.

- a) DCT b) Walsh
- c) DFT d) Harr
- 13) First order derivative operator is also called as \_\_\_\_\_
  - a) Laplacian c) Gradient
- b) Compass
  - d) None
- 14) JPEG is \_\_\_\_\_ standard.
  - a) Still image coding
  - c) Run-Length coding
- b) Video coding

.

d) None

Set

Seat	
No.	

### B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE PROCESSING

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 indicates full marks.

#### SECTION I

#### Q.2 Attempt any Four:

- a) Explain the process of sampling and quantization in image processing.
- **b)** Explain basic morphological operation.
- c) What do you mean by non linear transformation?
- d) What do you mean by color model and its importance?
- e) State Laplacian mask for four neighbors and also state effect of Laplacian operator.

#### Q.3 Attempt any Two:

- a) Explain relation between pixels in terms of connectivity, adjacency and neighbor hood.
- **b)** Define and explain spatial resolution, gray level resolution, histogram in detail.
- c) Explain dilation and erosion process with example.

#### **SECTION II**

#### Q.4 Attempt any four:

- a) Explain image segmentation using thresholding.
- b) Why need of Image compression, Explain 2-D-DFT transform?
- c) Write short note on face recognition.
- d) Explain Line detection using gradients in image.
- e) Write short note on redundancy and its types.

#### Q.5 Attempt any two.

- a) Explain the term fidelity and its types in detail.
- **b)** Write short note on
  - 1) Chain codes
  - 2) Boundary descriptors
- c) Explain image processing application based on remote sensing method in image.

Max. Marks: 56

14

14

14

## B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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.

**IMAGE PROCESSING** 

2) Figures to the right indicate full mark.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Seat

No.

#### Q.1 Choose the correct alternatives from the options.

Which is the image processing technique used to improve the quality of 1) image for human viewing?

b)

b)

d)

Enhancement

local operations

Mask operations

- a) compression
- c) restoration d) Analysis

#### Which type of enhancement operations are used to modify pixel values 2) according to the value of the pixel 's neighbors?

- a) Point operations
- c) global operations

#### 3) Which device is used to capture the fingerprint pattern?

- a) Capture device **Fingerprint sensor** b)
- **Digital sensor** c) 2d sensor d)

#### 4) Which of the following is a lossy coding?

- a) Huffman code
- b) Run-length code
- c) Uniform code
- d) Predictive coding without quantiser

The transform used in JPEG image Compression is \_\_\_\_\_. 5)

- a) DCT b) Walsh
- c) DFT d) Harr

6) First order derivative operator is also called as \_\_\_\_\_

- Laplacian b) a)
- Gradient C) d)
- 7) JPEG is \_\_\_\_\_ standard.

8)

- Still image coding a)
- Run-Length coding C)

D4 distance is called as \_\_\_\_ a) Euclidean distance

- b) City block distance
- c) Chess board distance None d)

d)

#### 9) The neighbors of a pixel p(x, y) are given by (x + 1, Y + 1), (x + 1, y - 1), (x - 1, y - 1), (x-1, y+1) Then these neighbors are called \_ diagonal neighbors b)

- a) 4-neighbors
- c) 8-neighbors d) None

Max. Marks: 70

Marks: 14

14

Set

SLR-FM-271



None

- b) Video coding
- Compass

				Set	Q
10)	CMYK color model is useful in a) Display devices c) Human color descriptor	b) d)	Printing applications None		
11)	<ul><li>S = L-I-r, where s = <i>olp</i> gray level ar</li><li>a) Image negative</li><li>c) Power law</li></ul>	nd r = i b) d)	/p gray level; means Image positive Log		
12)	Impulse noise is also called as a) Salt and Paper noise c) Gaussian noise	b) d)	Uniform noise None		
13)	Expanding the object size is nothing a) Erosion c) Thinning	but _ b) d)	Dilation None		
14)	Statement 1: A median filter is effec in an image.	tive in	minimizing salt and paper	noise	

Statement 2: A median filter is a linear filter.

- a) Statement 1 is true whereas Statement 2 is wrong
- b) Statement 1 I and 2 is true
- c) Statement 1 I and 2 is falsed) Statement 1 is false whereas Statement 2 is true

**SLR-FM-271** 

### B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE PROCESSING

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 indicates full marks.

#### SECTION I

#### Q.2 Attempt any Four:

- a) Explain the process of sampling and quantization in image processing.
- **b)** Explain basic morphological operation.
- c) What do you mean by non linear transformation?
- d) What do you mean by color model and its importance?
- e) State Laplacian mask for four neighbors and also state effect of Laplacian operator.

#### Q.3 Attempt any Two:

- a) Explain relation between pixels in terms of connectivity, adjacency and neighbor hood.
- **b)** Define and explain spatial resolution, gray level resolution, histogram in detail.
- c) Explain dilation and erosion process with example.

#### **SECTION II**

#### Q.4 Attempt any four:

- a) Explain image segmentation using thresholding.
- b) Why need of Image compression, Explain 2-D-DFT transform?
- c) Write short note on face recognition.
- d) Explain Line detection using gradients in image.
- e) Write short note on redundancy and its types.

#### Q.5 Attempt any two.

- a) Explain the term fidelity and its types in detail.
- **b)** Write short note on
  - 1) Chain codes
  - 2) Boundary descriptors
- c) Explain image processing application based on remote sensing method in image.

Max. Marks: 56

14

14

14

## B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering IMAGE PROCESSING**

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 mark.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

#### Q.1 Choose the correct alternatives from the options.

- Impulse noise is also called as \_\_\_\_ 1)
  - a) Salt and Paper noise b) Uniform noise
  - c) Gaussian noise d) None
- 2) Expanding the object size is nothing but \_
  - a) Erosion b)
  - c) Thinning d) None
- 3) Statement 1: A median filter is effective in minimizing salt and paper noise in an image.

Statement 2: A median filter is a linear filter.

- a) Statement 1 is true whereas Statement 2 is wrong
- b) Statement 1 I and 2 is true
- c) Statement 1 I and 2 is false
- d) Statement 1 is false whereas Statement 2 is true
- 4) Which is the image processing technique used to improve the quality of image for human viewing?
  - a) compression b) Enhancement
  - c) restoration d) Analysis
- Which type of enhancement operations are used to modify pixel values 5) according to the value of the pixel 's neighbors?
  - a) Point operations b) local operations
  - c) global operations d) Mask operations
- 6) Which device is used to capture the fingerprint pattern?
  - a) Capture device b) Fingerprint sensor
  - Digital sensor c) 2d sensor d)
- Which of the following is a lossy coding? 7)
  - a) Huffman code
  - b) Run-length code
  - c) Uniform code
  - d) Predictive coding without quantiser
- The transform used in JPEG image Compression is \_\_\_\_\_. 8) Walsh
  - a) DCT b) c) DFT d) Harr



Max. Marks: 70

Set

Marks: 14

14

- Dilation

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SLR-FM-271

Seat

No.

9) First order derivative operator is also called as \_\_\_\_\_.

- a) Laplacian
- c) Gradient

12)

b) Compass

None

None

Video coding

City block distance

**SLR-FM-271** 

Set R

d) None

b)

d)

- 10) JPEG is \_\_\_\_\_ standard.
  - a) Still image coding
  - c) Run-Length coding
- 11) D4 distance is called as \_\_\_\_\_.
  - a) Euclidean distance b)
  - c) Chess board distance d)
  - The neighbors of a pixel p(x, y) are given by (x + 1, Y+ 1), (x+ 1, y-1), (x-1, y-1),
  - (x-1, y+1) Then these neighbors are called \_\_\_\_\_ a) 4-neighbors b) diagon
    - b) diagonal neighbors
  - c) 8-neighbors d) None
- 13) CMYK color model is useful in \_\_\_\_\_.
  - a) Display devices b) Printing applications
  - c) Human color descriptor d) None
- 14) S = L-I-r, where s = *olp* gray level and r = i/p gray level; means \_\_\_\_\_.
  - a) Image negative b) Image positive
  - c) Power law d) Log

Seat	
No.	

### B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE PROCESSING

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 indicates full marks.

#### SECTION I

#### Q.2 Attempt any Four:

- a) Explain the process of sampling and quantization in image processing.
- **b)** Explain basic morphological operation.
- c) What do you mean by non linear transformation?
- d) What do you mean by color model and its importance?
- e) State Laplacian mask for four neighbors and also state effect of Laplacian operator.

#### Q.3 Attempt any Two:

- a) Explain relation between pixels in terms of connectivity, adjacency and neighbor hood.
- **b)** Define and explain spatial resolution, gray level resolution, histogram in detail.
- c) Explain dilation and erosion process with example.

#### **SECTION II**

#### Q.4 Attempt any four:

- a) Explain image segmentation using thresholding.
- b) Why need of Image compression, Explain 2-D-DFT transform?
- c) Write short note on face recognition.
- d) Explain Line detection using gradients in image.
- e) Write short note on redundancy and its types.

#### Q.5 Attempt any two.

- a) Explain the term fidelity and its types in detail.
- **b)** Write short note on
  - 1) Chain codes
  - 2) Boundary descriptors
- c) Explain image processing application based on remote sensing method in image.

Max. Marks: 56

14

14

14

IMAGE PROCESSING								
Day Time	& Date : 02:3	e: Tu 0 PN	esday,17-12-2019 I To 05:30 PM			Max. Marks: 70		
<b>Instructions:</b> 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book								
		2	P) Figures to the right indicate full	l mark	ζ.			
MCQ/Objective Type Questions								
Dura	tion: 3	BO Mi	nutes	-		Marks: 14		
Q.1	<b>Choo</b> 1)	o <b>se t</b> Whi a) c)	he correct alternatives from th ich device is used to capture the Capture device 2d sensor	<b>e opti</b> finger b) d)	<b>ons.</b> print pattern? Fingerprint sensor Digital sensor	14		
	2)	Wh a) b) c) d)	ich of the following is a lossy cod Huffman code Run-length code Uniform code Predictive coding without quanti	ling? ser				
	3)	The a) c)	e transform used in JPEG image ( DCT DFT	Comp b) d)	ression is Walsh Harr			
	4)	Firs a) c)	t order derivative operator is also Laplacian Gradient	b calle b) d)	d as Compass None			
	5)	JPE a) c)	G is standard. Still image coding Run-Length coding	b) d)	Video coding None			
	6)	D4 a) c)	distance is called as Euclidean distance Chess board distance	b) d)	City block distance None			
	7)	The (x-1 a) c)	e neighbors of a pixel p(x, y) are g , y+1) Then these neighbors are 4-neighbors 8-neighbors	given b callec b) d)	by (x + 1, Y+ 1), (x+ 1, I diagonal neighbors None	y-1), (x-1, y-1),		
	8)	CM a) c)	YK color model is useful in Display devices Human color descriptor	 b) d)	Printing applications None			
	9)	S = a) c)	L-I-r, where s = <i>olp</i> gray level an Image negative Power law	d r = i b) d)	/p gray level; means _ Image positive Log	·		

# B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Seat No.

## **SLR-FM-271**

Set S

SLR-FM-271 Set S

- 10) Impulse noise is also called as \_\_\_\_\_
  - a) Salt and Paper noise b) Uniform noise
  - c) Gaussian noise d) None
- 11) Expanding the object size is nothing but \_\_\_\_
  - a) Erosion b) Dilation
  - c) Thinning d) None
- 12) Statement 1: A median filter is effective in minimizing salt and paper noise in an image.

Statement 2: A median filter is a linear filter.

- a) Statement 1 is true whereas Statement 2 is wrong
- b) Statement 1 I and 2 is true
- c) Statement 1 I and 2 is false
- d) Statement 1 is false whereas Statement 2 is true
- 13) Which is the image processing technique used to improve the quality of image for human viewing?
  - a) compression

b) Enhancement

c) restoration

- d) Analysis
- 14) Which type of enhancement operations are used to modify pixel values according to the value of the pixel 's neighbors?
  - a) Point operationsc) global operations
- b) local operations
- d) Mask operations

Seat	
No.	

### B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering IMAGE PROCESSING

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 indicates full marks.

#### SECTION I

#### Q.2 Attempt any Four:

- a) Explain the process of sampling and quantization in image processing.
- **b)** Explain basic morphological operation.
- c) What do you mean by non linear transformation?
- d) What do you mean by color model and its importance?
- e) State Laplacian mask for four neighbors and also state effect of Laplacian operator.

#### Q.3 Attempt any Two:

- a) Explain relation between pixels in terms of connectivity, adjacency and neighbor hood.
- **b)** Define and explain spatial resolution, gray level resolution, histogram in detail.
- c) Explain dilation and erosion process with example.

#### **SECTION II**

#### Q.4 Attempt any four:

- a) Explain image segmentation using thresholding.
- b) Why need of Image compression, Explain 2-D-DFT transform?
- c) Write short note on face recognition.
- d) Explain Line detection using gradients in image.
- e) Write short note on redundancy and its types.

#### Q.5 Attempt any two.

- a) Explain the term fidelity and its types in detail.
- **b)** Write short note on
  - 1) Chain codes
  - 2) Boundary descriptors
- c) Explain image processing application based on remote sensing method in image.

Max. Marks: 56

14

14

14

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

### MCQ/Objective Type Questions

### **Duration: 30 Minutes**

#### Q.1 Choose the correct alternatives from the options.

- To what value should the bandwidth of x(n) has to be reduced in order to 1) avoid aliasing?
  - a) F/D b) F/2D c) F/4D d) None of the mentioned
- The linear filtering operation followed by down sampling on x(n) is not 2) time invariant.
  - b) False a) True
- 3) Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?
  - a) Parallel b) Cascade
  - c) Convolution d) None of the mentioned
- Which of the following methods are used in sampling rate conversion of a 4) digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned

#### 5) Which of the following is the disadvantage of sampling rate conversion by converting the signal into analog signal?

- a) Signal distortion
- b) Quantization effects
- c) New sampling rate can be arbitrarily selected
- d) Signal distortion & Quantization effects
- 6) Power spectral density function is a \_\_\_\_
  - a) Real and even function b) Non negative function
  - c) Periodic d) All of the mentioned
- Power spectrum describes distribution of \_\_\_\_\_ under frequency domain. 7)
  - Mean a) C) Gaussian

- b) Variance
- d) None of the mentioned

Max. Marks: 70

Marks: 14

14

Set

**SLR-FM-272** 

### Seat No.



- According to Parseval's theorem the energy spectral density curve is equal to \_\_\_\_\_.
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned
- 9) Autocorrelation function of periodic signal is equal to \_\_\_\_\_.
  - a) Energy of the signal
- b) Power of the signal
  - c) Its area in frequency domain d) None of the mentioned
- 10) Autocorrelation function of white noise will have?
  - a) Strong peak
- b) Infinite peak
- d) None of the mentioned
- 11) Rate of convergence is defined by \_\_\_\_\_ of algorithm.
  - b) Number of iterations

d) Accuracy

- a) Time spanc) Accuracy
- d) Complexity
- Computational complexity is a measure of
  - b) Number of iterations
- c) Number of operations
- 13) Which of the following is a method for implementing a FIR system?
  - a) Direct form

c) Weak peak

a) Time

12)

- b) Cascade form
- c) Lattice structure d) All of the mentioned
- 14) In IIR Filter design by the Bilinear Transformation, the Bilinear Transformation is a mapping from \_\_\_\_\_.
  - a) Z-plane to S-plane
- b) S-plane to Z-plane
- c) S-plane to J-plane
- d) J-plane to Z-plane

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

#### Section – I

#### Q.2 Attempt any two.

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$

= 0 otherwise

- Find the values for h(n) for N=7.
- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. c)

#### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. c)

#### Section – II

#### Q.4 Attempt any two. 14 Explain LMS algorithm used in adaptive filters. a) Explain power spectrum estimation using parametric method. b) Write a note on wavelet transform. c) Attempt any two. 14 Q.5 Explain MUSIC algorithm used for spectrum estimation. a) Explain application of adaptive filter for noise cancellation. b)

c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Seat No.

Max. Marks: 56

**SLR-FM-272** 

14

#### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

**Duration: 30 Minutes** 

**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.

### MCQ/Objective Type Questions

#### Q.1 Choose the correct alternatives from the options.

- According to Parseval's theorem the energy spectral density curve is 1) equal to .
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned

#### 2) Autocorrelation function of periodic signal is equal to \_\_\_\_\_

- a) Energy of the signal b) Power of the signal
- Its area in frequency domain d) None of the mentioned C)
- 3) Autocorrelation function of white noise will have?
  - a) Strong peak b) Infinite peak
  - c) Weak peak d) None of the mentioned
- 4) Rate of convergence is defined by \_\_\_\_ \_ of algorithm.
  - a) Time span Number of iterations
    - c) Accuracy
- Computational complexity is a measure of 5)
  - a) Time
  - c) Number of operations
- Which of the following is a method for implementing a FIR system? 6)
  - a) Direct form b) Cascade form
  - c) Lattice structure d) All of the mentioned
- In IIR Filter design by the Bilinear Transformation, the Bilinear 7) Transformation is a mapping from \_
  - a) Z-plane to S-plane b) S-plane to Z-plane
  - c) S-plane to J-plane d) J-plane to Z-plane
- 8) To what value should the bandwidth of x(n) has to be reduced in order to avoid aliasing?
  - b) F/2D a) F/D c) F/4D d) None of the mentioned
- 9) The linear filtering operation followed by down sampling on x(n) is not time invariant.
  - a) True b) False

**SLR-FM-272** 

Set

Max. Marks: 70



Seat No.

Marks: 14

- b) Number of iterations
- d) Accuracy

- b)
  - d) Complexity

Set Q

- Sampling rate conversion by the rational factor I/D is accomplished by 10) what connection of interpolator and decimator?
  - a) Parallel

b) Cascade

c) Convolution

- d) None of the mentioned
- 11) Which of the following methods are used in sampling rate conversion of a digital signal?
  - D/A convertor and A/D convertor a)
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned
- 12) Which of the following is the disadvantage of sampling rate conversion by converting the signal into analog signal?
  - Signal distortion a)
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- Power spectral density function is a 13)
  - a) Real and even function c) Periodic
- b) Non negative function
- d) All of the mentioned
- 14) Power spectrum describes distribution of \_\_\_\_\_ under frequency domain.
  - a) Mean
  - Gaussian c)

b) Variance d) None of the mentioned

### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

#### Section – I

#### Q.2 Attempt any two.

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$

= 0 otherwise

Find the values for h(n) for N=7.

- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. c)

#### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. c)

#### Section – II

#### Q.4 Attempt any two. 14 Explain LMS algorithm used in adaptive filters. a) Explain power spectrum estimation using parametric method. b) Write a note on wavelet transform. c) Attempt any two. 14 Q.5 Explain MUSIC algorithm used for spectrum estimation. a)

- Explain application of adaptive filter for noise cancellation. b)
- c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Max. Marks: 56

**SLR-FM-272** 

Set

Seat No.

14

#### B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Seat No.

#### Q.1 Choose the correct alternatives from the options.

- Which of the following is the disadvantage of sampling rate conversion by 1) converting the signal into analog signal?
  - Signal distortion a)
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- Power spectral density function is a 2) b) Non negative function
  - a) Real and even function c)
    - Periodic d) All of the mentioned
- 3) Power spectrum describes distribution of \_\_\_\_\_ under frequency domain.
  - b) Variance a) Mean
  - c) Gaussian d) None of the mentioned
- 4) According to Parseval's theorem the energy spectral density curve is equal to .
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned
- 5) Autocorrelation function of periodic signal is equal to
  - b) Power of the signal a) Energy of the signal
  - c) Its area in frequency domain d) None of the mentioned
- Autocorrelation function of white noise will have? 6)
  - a) Strong peak b) Infinite peak
  - c) Weak peak d) None of the mentioned
- 7) Rate of convergence is defined by \_ of algorithm.
  - a) Time span b) Number of iterations d) Complexity
  - c) Accuracy
  - Computational complexity is a measure of \_
    - a) Time C)

8)

b) Number of iterations Number of operations d) Accuracy

## **SLR-FM-272**

Max. Marks: 70

Marks: 14

Set R

- 9) Which of the following is a method for implementing a FIR system?
  - a) Direct form

- b) Cascade form
- c) Lattice structure d) All of the mentioned
- 10) In IIR Filter design by the Bilinear Transformation, the Bilinear Transformation is a mapping from \_\_\_\_\_.
  - a) Z-plane to S-plane b) S-plane to Z-plane
  - c) S-plane to J-plane d) J-plane to Z-plane
- 11) To what value should the bandwidth of x(n) has to be reduced in order to avoid aliasing?
  - a) F/D
- b) F/2D
- c) F/4D d) None of the mentioned
- 12) The linear filtering operation followed by down sampling on x(n) is not time invariant.
  - a) True b) False
- 13) Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?
  - a) Parallel

- b) Cascade
- c) Convolution d) None of the mentioned
- 14) Which of the following methods are used in sampling rate conversion of a digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned
## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

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.

## Section – I

## Q.2 Attempt any two.

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$

= 0 otherwise

- Find the values for h(n) for N=7.
- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. c)

### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. c)

## Section – II

### Q.4 Attempt any two. 14 Explain LMS algorithm used in adaptive filters. a) Explain power spectrum estimation using parametric method. b) Write a note on wavelet transform. c) Attempt any two. Q.5 Explain MUSIC algorithm used for spectrum estimation. a)

- Explain application of adaptive filter for noise cancellation. b)
- c) Explain Minimum Mean Square (MMS) criterion in adaptive filters.

Max. Marks: 56

14

14

## **SLR-FM-272**

## Seat No.

## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

c) Weak peak

**Duration: 30 Minutes** 

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.

## MCQ/Objective Type Questions

### Q.1 Choose the correct alternatives from the options.

- Autocorrelation function of white noise will have? 1)
  - b) Infinite peak Strong peak a)
    - d) None of the mentioned
- 2) Rate of convergence is defined by \_ of algorithm.
  - a) Time span b) Number of iterations
  - d) Complexity c) Accuracy

### 3) Computational complexity is a measure of \_\_\_\_\_

- a) Time b) Number of iterations
- c) Number of operations d) Accuracy
- 4) Which of the following is a method for implementing a FIR system?
  - a) Direct form b) Cascade form
  - c) Lattice structure d) All of the mentioned
- 5) In IIR Filter design by the Bilinear Transformation, the Bilinear Transformation is a mapping from \_
  - a) Z-plane to S-plane
  - S-plane to Z-plane c) S-plane to J-plane d) J-plane to Z-plane
- To what value should the bandwidth of x(n) has to be reduced in order to 6) avoid aliasing?

b)

- b) F/2D a) F/D
- c) F/4D d) None of the mentioned
- 7) The linear filtering operation followed by down sampling on x(n) is not time invariant.
  - a) True b) False
- Sampling rate conversion by the rational factor I/D is accomplished by 8) what connection of interpolator and decimator?
  - a) Parallel c) Convolution
- b) Cascade d) None of the mentioned

Max. Marks: 70

**SLR-FM-272** 

Marks: 14

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- 9) Which of the following methods are used in sampling rate conversion of a digital signal?
  - a) D/A convertor and A/D convertor
  - b) Performing entirely in digital domain
  - c) None of the mentioned
  - d) Both of the mentioned
- 10) Which of the following is the disadvantage of sampling rate conversion by converting the signal into analog signal?
  - a) Signal distortion
  - b) Quantization effects
  - c) New sampling rate can be arbitrarily selected
  - d) Signal distortion & Quantization effects
- 11) Power spectral density function is a \_

a) Real and even function

- b) Non negative function
- c) Periodic d) All of the mentioned
- 12) Power spectrum describes distribution of \_\_\_\_\_ under frequency domain.
  - a) Mean
- b) Variance
- c) Gaussian d) None of the mentioned
- According to Parseval's theorem the energy spectral density curve is equal to \_\_\_\_\_.
  - a) Area under magnitude of the signal
  - b) Area under square of the magnitude of the signal
  - c) Area under square root of magnitude of the signal
  - d) None of the mentioned
- 14) Autocorrelation function of periodic signal is equal to \_\_\_\_
  - a) Energy of the signal
- b) Power of the signal
- c) Its area in frequency domain d) None of the mentioned

# Set

## B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ADVANCED DSP**

Section – I

Day & Date: Tuesday, 17-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

# Q.2 Attempt any two.

- Design an ideal low pass filter with a frequency response. a)
  - $H_d(e^{jw}) = 1$  for  $0 \le |w| \le \pi/4$ = 0 otherwise

Find the values for h(n) for N=7.

- Explain digital filter banks with polyphase structures. b)
- Explain FIR Wiener filter for filtering and prediction. c)

### Q.3 Attempt any two.

- Draw the direct form II structure for the system. a)
- y(n) = -0.1 y(n-1) + 0.72 y(n-2) + 0.7 x(n) 0.252 x(n-2).
- Explain Sampling rate conversion using interpolation and decimation. b)
- Explain AR and ARMA model. C)

## Section – II

### Q.4 Attempt any two.

- Explain LMS algorithm used in adaptive filters. a)
- b) Explain power spectrum estimation using parametric method.
- Write a note on wavelet transform. c)

### Q.5 Attempt any two.

- Explain MUSIC algorithm used for spectrum estimation. a)
- Explain application of adaptive filter for noise cancellation. b)
- Explain Minimum Mean Square (MMS) criterion in adaptive filters. c)

**SLR-FM-272** 

Max. Marks: 56

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ictio	ns: 1	I) Q. No. 1 is compulsory and sh	ould	be solved in first 30 minutes in a
		book.		-
	2	2) Figures to the right indicate ful	i ma	rks.
		MCQ/Objective T	уре	Questions
ion: 3	80 Mi	inutes		Μ
Choo	ose t	the correct alternatives from the	ne o	ptions and rewrite the sentend
1)	Use	er data is transferred in which of	the f	rame mode protocol.
	a)	LAPF control	b)	LAPF core
	C)	Circuit switching	d)	None
2)	Bas	sic access means		
	a)	30B+1D	b)	2B+1D
	c)	both a&b	d)	None
3)	The	e main data channel for ordinary	ISDI	N user is
,	a)	B channel	b)	D channel
	c)	H channel	d)	None
4)	X.2	5 is standard for		
.,	a)	Frame relay	b)	Packet switching
	c)́	both a&b	d)	None
5)	ISD	N relies on standard voice data	rate	of
0)	a)	192Kbps	b)	64Kbps
	c)	1.5Mbps	d)	None
6)	, Wh	ich of the following is faster but i	, Inrol	iable protocol?
0)	a)	Frame relay	h)	Packet switching
	c)	Circuit switching	d)	None
7)	•) Ma	dulation domodulation is require	-,- 	
()	1VIU 2)	Bridge	uat h)	Applog switch
	a) c)	Digital switch	d)	None
	0,		u,	

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering **BROAD BAND COMMUNICATION**

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

Instruc answer

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- Q.1 C
  - 1

  - 2
  - 3)
  - 4
  - 5

- c) Digital switch
- 8) CMI means coding.
  - a) Coded marked inversion
  - c) Coding mark integration
- VPI is \_\_\_\_\_ bits at the user network interface. 9)
  - a) 4 b) 8
  - c) 12 d) 16
- In the SYNC state, the \_\_\_\_\_is used for error detection and correction. 10)
  - a) HUNT b) Pre sync
  - c) HEC d) DLCI

- b) Cell mark integration
- d) None

Max. Marks: 70

larks: 14

**SLR-FM-273** 



Set P 11) Email is an example of \_\_\_\_\_service. a) Interactive b) Distribution c) Broadcast d) None 12) AAL type \_\_\_\_\_deal with constant bit rate source. a) 1 b) 2 3 d) 4 c) The initial specifications of AAL type \_\_\_\_\_and \_\_\_\_\_ were very similar in 13) terms of PDU format and functionality. b) 2, 3 a) 1, 2 c) 3, 4 d) 4, 5 Which traffic type is used by internet access? 14) a) CBR

a) CBRb) VBRc) ABRd) UBR

**SLR-FM-273** 

Seat	
No.	

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section – I

## Q.2 Attempt any four of the following questions.

- a) Explain packet switching along with datagram and virtual circuit approach.
- **b)** With diagram explain I series recommendations.
- c) Write a note on ISDN address structure.
- **d)** With suitable diagram explain the effect of packet size on transmission time.
- e) Compare basic access and primary access of ISDN channel structure.

## Q.3 Attempt any two of the following questions.

- a) Draw and Explain LAPF Control protocol formats.
- **b)** Draw, Explain and Compare digital vs. Analog switching.
- c) Explain ISDN protocols at the user network interface.

## Section – II

## Q.4 Attempt any four of the following questions.

- a) Explain AAL type I Protocol for ATM.
- b) What are the different services provided with B-ISDN?
- c) Write a short note on Header Error control (HEC) mechanism used in ATM.
- d) With block diagram explain B-ISDN user network interface.
- e) Explain header format of ATM Cell.

## Q.5 Attempt any two of the following questions.

- a) Write a note on ATM cell processing in a switch.
- b) Explain B-ISDN architecture.
- c) Compare virtual channel and virtual path connections of ATM.



Max. Marks: 56

12

16

16

Seat No.

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION

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 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

b) Cell mark integration

- 1) CMI means \_\_\_\_\_coding.
  - a) Coded marked inversion
  - c) Coding mark integration d) None
- 2) VPI is \_\_\_\_\_ bits at the user network interface.
  - a) 4 b) 8
  - c) 12 d) 16
- 3) In the SYNC state, the \_\_\_\_\_is used for error detection and correction.
  - a) HUNT b) Pre sync c) HEC d) DLCI
- 4) Email is an example of service.
  - a) Interactive b) Distribution
  - c) Broadcast d) None
- 5) AAL type \_\_\_\_\_deal with constant bit rate source.
  - a) 1 b) 2 c) 3 d) 4
- 6) The initial specifications of AAL type \_\_\_\_\_and \_\_\_\_\_ were very similar in terms of PDU format and functionality.
  - a) 1,2 b) 2,3 c) 3,4 d) 4,5

7) Which traffic type is used by internet access?

- a) CBR b) VBR c) ABR d) UBR
- 8) User data is transferred in which of the frame mode protocol.
  - a) LAPF control b) LAPF core
  - c) Circuit switching d) None

# 9) Basic access means \_\_\_\_\_. a) 30B+1D b) 2B+1D

- c) both a&b d) None
- 10) The main data channel for ordinary ISDN user is \_\_\_\_\_.
  - a) B channelb) D channelc) H channeld) None

Marks: 14

Max. Marks: 70

Set Q

**SLR-FM-273** Set Q

- X.25 is standard for \_\_\_\_\_. 11)
  - a) Frame relay c) both a&b

- b) Packet switching
- d) None
- 12) ISDN relies on standard voice data rate of \_\_\_\_\_ \_\_\_\_-.
  - a) 192Kbps b) 64Kbps
  - c) 1.5Mbps d) None
- Which of the following is faster but unreliable protocol? 13)
  - a) Frame relay b) Packet switching
  - c) Circuit switching d) None
- Modulation-demodulation is required at every hop of a network using \_\_\_\_\_. 14)
  - a) Bridge

b) Analog switch

Digital switch C)

d) None

Seat	
No.	

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section – I

## Q.2 Attempt any four of the following questions.

- a) Explain packet switching along with datagram and virtual circuit approach.
- **b)** With diagram explain I series recommendations.
- c) Write a note on ISDN address structure.
- d) With suitable diagram explain the effect of packet size on transmission time.
- e) Compare basic access and primary access of ISDN channel structure.

## Q.3 Attempt any two of the following questions.

- a) Draw and Explain LAPF Control protocol formats.
- **b)** Draw, Explain and Compare digital vs. Analog switching.
- c) Explain ISDN protocols at the user network interface.

## Section – II

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- b) What are the different services provided with B-ISDN?
- c) Write a short note on Header Error control (HEC) mechanism used in ATM.
- d) With block diagram explain B-ISDN user network interface.
- e) Explain header format of ATM Cell.

## Q.5 Attempt any two of the following questions.

- a) Write a note on ATM cell processing in a switch.
- b) Explain B-ISDN architecture.
- c) Compare virtual channel and virtual path connections of ATM.



Max. Marks: 56

12

16

16

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION**

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

Instructions: 1) Q. No. 7	1 is compulsory and should be solved in first 30 minutes in answer
book.	
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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

- ISDN relies on standard voice data rate of 1) b) 64Kbps
  - a) 192Kbps
  - c) 1.5Mbps d) None
- 2) Which of the following is faster but unreliable protocol?
  - b) Packet switching a) Frame relay d) None
  - c) Circuit switching
- 3) Modulation-demodulation is required at every hop of a network using \_\_\_\_\_.
  - a) Bridge b) Analog switch d) None
  - c) Digital switch
- CMI means coding. 4)
  - a) Coded marked inversion
  - d) None c) Coding mark integration

VPI is bits at the user network interface. 5)

- a) 4 b) 8
- c) 12 d) 16
- In the SYNC state, the \_\_\_\_\_is used for error detection and correction. 6)
  - a) HUNT b) Pre sync
  - c) HEC d) DLCI
- Email is an example of service. 7) Interactive a)
  - b) Distribution Broadcast d) None c)
- AAL type \_\_\_\_\_deal with constant bit rate source. 8) a) 1
  - b) 2
  - d) 4 c) 3
- The initial specifications of AAL type \_\_\_\_\_and \_\_\_\_\_ were very similar in 9) terms of PDU format and functionality.
  - a) 1,2 b) 2, 3 d) 4,5 c) 3, 4
- Which traffic type is used by internet access? 10)
  - a) CBR b) VBR c) ABR d) UBR





Set

Max. Marks: 70

Marks: 14

- 11) User data is transferred in which of the frame mode protocol.
  - a) LAPF control

b) LAPF core

**SLR-FM-273** 

Set R

- c) Circuit switching
- d) None
- 12) Basic access means \_\_\_\_\_.
  - a) 30B+1D

- b) 2B+1D
- c) both a&b d) None

13) The main data channel for ordinary ISDN user is \_\_\_\_\_.

- a) B channel
- c) H channel

- b) D channeld) None
- 14) X.25 is standard for \_\_\_\_\_.
  - a) Frame relay
  - c) both a&b

- b) Packet switching
- d) None

Seat	
No.	

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

## Section – I

## Q.2 Attempt any four of the following questions.

- a) Explain packet switching along with datagram and virtual circuit approach.
- b) With diagram explain I series recommendations.
- c) Write a note on ISDN address structure.
- **d)** With suitable diagram explain the effect of packet size on transmission time.
- e) Compare basic access and primary access of ISDN channel structure.

## Q.3 Attempt any two of the following questions.

- a) Draw and Explain LAPF Control protocol formats.
- **b)** Draw, Explain and Compare digital vs. Analog switching.
- c) Explain ISDN protocols at the user network interface.

## Section – II

## Q.4 Attempt any four of the following questions.

- a) Explain AAL type I Protocol for ATM.
- **b)** What are the different services provided with B-ISDN?
- c) Write a short note on Header Error control (HEC) mechanism used in ATM.
- d) With block diagram explain B-ISDN user network interface.
- e) Explain header format of ATM Cell.

## Q.5 Attempt any two of the following questions.

- a) Write a note on ATM cell processing in a switch.
- b) Explain B-ISDN architecture.
- c) Compare virtual channel and virtual path connections of ATM.



Max. Marks: 56

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B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION** 

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 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

- In the SYNC state, the \_\_\_\_\_\_ is used for error detection and correction. 1)
  - a) HUNT b) Pre sync c) HEC d) DLCI
- 2) Email is an example of \_\_\_\_\_service.
  - a) Interactive b) Distribution d) None c) Broadcast
- 3) AAL type \_\_\_\_\_deal with constant bit rate source.
  - a) 1 b) 2 d) 4 c) 3

The initial specifications of AAL type and were very similar in 4) terms of PDU format and functionality.

- b) 2,3 a) 1,2 c) 3, 4 d) 4, 5
- Which traffic type is used by internet access? 5)
  - a) CBR b) VBR
  - c) ABR d) UBR
- 6) User data is transferred in which of the frame mode protocol.
  - a) LAPF control b) LAPF core d) None c) Circuit switching
- 7) Basic access means \_\_\_\_\_ a) 30B+1D b) 2B+1D c) both a&b d) None
- 8) The main data channel for ordinary ISDN user is \_\_\_\_
- b) D channel a) B channel d) None
  - c) H channel
- X.25 is standard for \_\_\_\_\_. 9) a) Frame relay b) Packet switching
  - c) both a&b d) None
- ISDN relies on standard voice data rate of \_ 10)
  - b) 64Kbps a) 192Kbps 1.5Mbps c) d) None



Marks: 14

Max. Marks: 70

- 11) Which of the following is faster but unreliable protocol?
  - a) Frame relay

a) Bridge

c)

b) Packet switching

b) Cell mark integration

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- c) Circuit switching
- d) None
- 12) Modulation-demodulation is required at every hop of a network using \_\_\_\_\_.
  - b) Analog switch
    - d) None

d) None

13) CMI means \_\_\_\_\_coding.

Digital switch

- a) Coded marked inversion
- c) Coding mark integration
- 14) VPI is \_\_\_\_\_ bits at the user network interface.
  - a) 4
  - c) 12

- b) 8
- d) 16

Seat	
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## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering BROAD BAND COMMUNICATION

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

**Instructions:** 1) All questions are compulsory.

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## Section – I

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- d) With suitable diagram explain the effect of packet size on transmission time.
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- a) Draw and Explain LAPF Control protocol formats.
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## Section – II

## Q.4 Attempt any four of the following questions.

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- b) What are the different services provided with B-ISDN?
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- d) With block diagram explain B-ISDN user network interface.
- e) Explain header format of ATM Cell.

## Q.5 Attempt any two of the following questions.

- a) Write a note on ATM cell processing in a switch.
- b) Explain B-ISDN architecture.
- c) Compare virtual channel and virtual path connections of ATM.



Max. Marks: 56

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## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** MULTIMEDIA COMMUNICATION TECHNIQUES

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 right indicate full marks.

## 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

The number of lines scanned per frame in the raster on the picture tube 1) screen is .

a)	525	b)	262
c)	20	d)	10

- 2) In the frame for which interlaced scanning is used, alternate lines are skipped during vertical scanning because \_\_\_\_\_.
  - a) The trace is slower than the retrace
  - b) The vertical scanning frequency is doubled from 30 to 60 Hz
  - c) The horizontal scanning is slower than vertical scanning
  - d) The frame has a 4:3 aspect ratio

### How many H lines are there in each field? 3)

a)	8 ½ lines	b)	10 ½ lines
	000 1/ 1.	I)	

- c) 262 ½ lines 325 lines d)
- 4) How many H lines are there in each V retrace?
  - a) one two b)
  - c) three four d)
- Which one of the following is false? 5)
  - a) the l video hues are orange or cyan
  - b) The transmitter matrix output includes Y, I, and Q video
  - c) A three-gun picture tube that can serve as a matrix
  - d) A fully saturated color is mostly white
- The color with the most luminance is 6)
  - a) Red b) Yellow c) Green d) Blue
  - The aspect ratio HDTV is \_\_\_\_
- 7) b) 18:5 4:3 a)
  - c) 14:8 16:9 d)

8) \_\_\_\_\_ is a standard to allow telephones on the public network to talk to computers connected to the Internet.

- a) SIP b) H:323 c) Q.991
  - none of the above d)



Max. Marks: 70

Set P

We can divide audio and video services into \_\_\_\_\_ broad categories. 11)

is the protocol designed to handle real-time traffic on the Internet.

UDP

Multicast

none of the above.

None of the above

b)

d)

b)

d)

In a real-time video conference, data from the server is \_\_\_\_\_ to the

- a) three b) two c) four d) none of the above
- 12) audio/video refers to on-demand requests for compressed audio/video files.
  - a) Streaming live b) Streaming stored d) None of the above
  - c) Interactive
- A \_\_\_\_\_ adds signals from different sources to create a single signal. 13)
  - a) Timestamp Sequence number b)
    - None of the above C) Mixer d)
- 14) A \_\_\_\_\_ changes the format of a high-bandwidth video signal to a lower quality narrow bandwidth signal.
  - a) Timestamp

9)

10)

a) TCP

c) RTP

a)

c)

client sites. Unicast

Broadcast

c) Translator

- b) Sequence number
- d) None of the above

Seat	
No.	

Set P

## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM **Instructions:** 1) All questions are compulsory. 2) Figures to right indicates full marks. Attempt any four of the following questions. 16 Q.2 Compare Compact and Conventional Discs. a) Explain TV transmitter block diagrams. b) Write Note on: c) Luminance signal i) ii) Chrominance signal With neat block diagram explain Video IF amplifier. d) Write short note on High Definition TV. e) Attempt any two of the following questions. 12 Q.3 Briefly explain Principle of disc recording and reproduction. a) Write short note on NTSC. SECAM and PAL colour TV systems. b) With neat block diagram explain colour burst circuit. C) Attempt any four of the following questions. 16 Q.4 What is need of multimedia? Discuss advantages of it. a) Which are the elements of multimedia system? b) c) Write note on broadband multiservice networks. Explain audio compression. d) What is the need of compression? Explain any one technique of image e) compression. Q.5 Attempt any two of the following questions. 12 Enlist and explain multimedia application. a) Write short note on multimedia networks. b)

c) Compare MPEG-1, MPEG-2, and MPEG-4.

## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** MULTIMEDIA COMMUNICATION TECHNIQUES

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 right indicate full marks.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

a)

Seat No.

Marks: 14

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

- 1) \_ is a standard to allow telephones on the public network to talk to computers connected to the Internet.
  - a) SIP H:323 b)
  - c) Q.991 d) none of the above
- 2) is the protocol designed to handle real-time traffic on the Internet.
  - TCP UDP b) a)
  - RTP d) none of the above. C)
- In a real-time video conference, data from the server is to the 3) client sites.
  - a) Unicast b) Multicast
  - Broadcast None of the above d) c)
- 4) We can divide audio and video services into broad categories.
  - a) three b) two c) four
    - d) none of the above
- 5) audio/video refers to on-demand requests for compressed audio/video files.
  - Streaming live b) Streaming stored
  - None of the above Interactive d) C)
- 6) adds signals from different sources to create a single signal. А
  - Timestamp a) b) Sequence number
  - Mixer None of the above c) d)
- 7) A changes the format of a high-bandwidth video signal to a lower quality narrow bandwidth signal.
  - a) Timestamp c) Translator
    - b) Sequence number None of the above d)
- 8) The number of lines scanned per frame in the raster on the picture tube screen is
  - a) 525 262 b)
  - 20 d) 10 c)

Max. Marks: 70

## In the frame for which interlaced scanning is used, alternate lines are skipped during vertical scanning because \_\_\_\_\_.

- a) The trace is slower than the retrace
- b) The vertical scanning frequency is doubled from 30 to 60 Hz
- c) The horizontal scanning is slower than vertical scanning
- d) The frame has a 4:3 aspect ratio

### 10) How many H lines are there in each field?

- a) 8 ½ lines b) 10 ½ lines
- c) 262 ½ lines d) 325 lines
- 11) How many H lines are there in each V retrace?
  - a) one b) two
  - c) three d) four
- 12) Which one of the following is false?
  - a) the I video hues are orange or cyan
  - b) The transmitter matrix output includes Y, I, and Q video
  - c) A three-gun picture tube that can serve as a matrix
  - d) A fully saturated color is mostly white

### 13) The color with the most luminance is \_\_\_\_\_.

a)	Red	b)	Yellow
c)	Green	d)	Blue

- 14) The aspect ratio HDTV is \_\_\_\_\_.
  - a) 4:3 b) 18:5 c) 14:8 d) 16:9

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## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM **Instructions:** 1) All questions are compulsory. 2) Figures to right indicates full marks. Attempt any four of the following questions. 16 Q.2 Compare Compact and Conventional Discs. a) Explain TV transmitter block diagrams. b) Write Note on: c) Luminance signal i) ii) Chrominance signal With neat block diagram explain Video IF amplifier. d) Write short note on High Definition TV. e) Attempt any two of the following questions. 12 Q.3 Briefly explain Principle of disc recording and reproduction. a) Write short note on NTSC. SECAM and PAL colour TV systems. b) With neat block diagram explain colour burst circuit. C) Attempt any four of the following questions. 16 Q.4 What is need of multimedia? Discuss advantages of it. a) Which are the elements of multimedia system? b) c) Write note on broadband multiservice networks. Explain audio compression. d) What is the need of compression? Explain any one technique of image e) compression. Q.5 Attempt any two of the following questions. 12 Enlist and explain multimedia application. a) Write short note on multimedia networks. b)

c) Compare MPEG-1, MPEG-2, and MPEG-4.

## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

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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. 14
  - 1) Which one of the following is false?
    - a) the I video hues are orange or cyan
    - b) The transmitter matrix output includes Y, I, and Q video
    - c) A three-gun picture tube that can serve as a matrix
    - d) A fully saturated color is mostly white
  - 2) The color with the most luminance is \_\_\_\_\_
  - a) Red
    b) Yellow
    c) Green
    d) Blue
    3) The aspect ratio HDTV is \_\_\_\_\_.
    a) 4:3
    b) 18:5
    - c) 14:8 d) 16:9
  - 4) \_\_\_\_\_ is a standard to allow telephones on the public network to talk to computers connected to the Internet.
    - a) SIP b) H:323
    - c) Q.991 d) none of the above
  - 5) \_\_\_\_\_ is the protocol designed to handle real-time traffic on the Internet.
    - a) TCP b) UDP c) RTP d) none c
      - d) none of the above.
  - 6) In a real-time video conference, data from the server is \_\_\_\_\_ to the client sites.
    - a) Unicast b) Multicast
    - c) Broadcast d) None of the above
  - 7) We can divide audio and video services into \_\_\_\_\_ broad categories.
    - a) threeb) twoc) fourd) none of the above
  - 8) \_\_\_\_\_ audio/video refers to on-demand requests for compressed audio/video files.
    - a) Streaming live b) Streaming stored
    - c) Interactive d) None of the above
  - 9) A \_\_\_\_\_ adds signals from different sources to create a single signal.
    - a) Timestampb) Sequence numberc) Mixerd) None of the above



Marks: 14

Max. Marks: 70

10) A \_\_\_\_\_ changes the format of a high-bandwidth video signal to a lower quality narrow bandwidth signal.

- a) Timestamp
- b) Sequence number

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- c) Translator d) None of the above
- 11) The number of lines scanned per frame in the raster on the picture tube screen is\_\_\_\_\_.
  - a) 525 b) 262
  - c) 20 d) 10
- 12) In the frame for which interlaced scanning is used, alternate lines are skipped during vertical scanning because \_\_\_\_\_.
  - a) The trace is slower than the retrace
  - b) The vertical scanning frequency is doubled from 30 to 60 Hz
  - c) The horizontal scanning is slower than vertical scanning
  - d) The frame has a 4:3 aspect ratio
- 13) How many H lines are there in each field?
  - a) 8 ½ lines b) 10 ½ lines
  - c) 262 ½ lines d) 325 lines
- 14) How many H lines are there in each V retrace?
  - a) one b) two
  - c) three d) four

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## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MULTIMEDIA COMMUNICATION TECHNIQUES

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- **b)** Write short note on multimedia networks.
- c) Compare MPEG-1, MPEG-2, and MPEG-4.

Seat	
No.	

## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

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2) Figures to 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

b)

- 1) In a real-time video conference, data from the server is \_\_\_\_\_ to the client sites.
  - a) Unicast
  - c) Broadcast d) None of the above
- 2) We can divide audio and video services into broad categories.
  - a) three b) two c) four
    - d) none of the above

Multicast

- 3) audio/video refers to on-demand requests for compressed audio/video files.
  - a) Streaming live b) Streaming stored
  - c) Interactive None of the above d)
- 4) \_\_\_\_adds signals from different sources to create a single signal. Α\_
  - a) Timestamp Sequence number b)
  - c) Mixer None of the above d)
- 5) A \_\_\_\_\_ changes the format of a high-bandwidth video signal to a lower quality narrow bandwidth signal.
  - a) Timestamp b) Sequence number
  - C) Translator d) None of the above
- 6) The number of lines scanned per frame in the raster on the picture tube screen is .

a)	525	b)	262
c)	20	d)	10

- 7) In the frame for which interlaced scanning is used, alternate lines are skipped during vertical scanning because \_\_\_\_\_.
  - a) The trace is slower than the retrace
  - The vertical scanning frequency is doubled from 30 to 60 Hz b)
  - c) The horizontal scanning is slower than vertical scanning
  - d) The frame has a 4:3 aspect ratio
- 8) How many H lines are there in each field? 10 ½ lines b)
  - a) 8 ½ lines
  - c) 262 ½ lines d) 325 lines



Max. Marks: 70

9) How many H lines are there in each V retrace?

- a) one b) two
- c) three d) four
- 10) Which one of the following is false?
  - a) the I video hues are orange or cyan
  - b) The transmitter matrix output includes Y, I, and Q video
  - c) A three-gun picture tube that can serve as a matrix
  - d) A fully saturated color is mostly white

### 11) The color with the most luminance is \_\_\_\_\_

- a) Red b) Yellow
- c) Green d) Blue
- 12) The aspect ratio HDTV is \_\_\_\_\_.
  - a) 4:3 b) 18:5
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- 13) \_\_\_\_\_ is a standard to allow telephones on the public network to talk to computers connected to the Internet.
  - a) SIP

- b) H:323
- c) Q.991 d) none of the above
- 14) \_\_\_\_\_ is the protocol designed to handle real-time traffic on the Internet.
  - a) TCP
  - c) RTP

- b) UDP
- d) none of the above.

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## B.E. (Part - II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM **Instructions:** 1) All questions are compulsory. 2) Figures to right indicates full marks. Attempt any four of the following questions. 16 Q.2 Compare Compact and Conventional Discs. a) Explain TV transmitter block diagrams. b) Write Note on: c) Luminance signal i) ii) Chrominance signal With neat block diagram explain Video IF amplifier. d) Write short note on High Definition TV. e) Attempt any two of the following questions. 12 Q.3 Briefly explain Principle of disc recording and reproduction. a) Write short note on NTSC. SECAM and PAL colour TV systems. b) With neat block diagram explain colour burst circuit. C) Attempt any four of the following questions. 16 Q.4 What is need of multimedia? Discuss advantages of it. a) Which are the elements of multimedia system? b) c) Write note on broadband multiservice networks. Explain audio compression. d) What is the need of compression? Explain any one technique of image e) compression. Q.5 Attempt any two of the following questions. 12 Enlist and explain multimedia application. a)

- **b)** Write short note on multimedia networks.
- c) Compare MPEG-1, MPEG-2, and MPEG-4.

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 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.
- 3) Assume suitable data if necessary.
- 4) Draw neat diagram whenever 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) Where is the return address stored after execution of the Branch-and-Link
  - (BL) instruction in ARM?
  - a) In the stack

- b) In the register r14d) None of these
- c) In the program counter pc
- 2) NRE cost can be defined by \_\_\_\_\_
  - a) The one time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded systems
  - d) None of the above
- 3) ARM uses the thumb\_\_\_\_\_ bit instruction set to improve code density.
  - a) 32 b) 8 c) 64 d) 16
- 4) The\_\_\_\_\_ directive allows the programmer to specify the memory locations where programs, subroutines or the data will resides.
  - a) ALIGN b) AREA
  - c) ENTRY d) END
- 5) In LPC 2148 \_\_\_\_\_ pin select register is used to configure port pins P0.0 to P0.1.15.
  - a) PINSEL1 b) PINSEL0 c) IODIR2 d) IOSET0
- 6) Which of the following instructions are called Program Status Register transfer instructions?
  - a) LDR, STR b) LDM, STM
  - c) MCR, MRC d) MSR, MRS
- 7) A privileged mode allows \_\_\_\_\_
  - a) Full read access to cpsrb)c) Full write access to cpsrd)
    - b) Full read write access to cpsrd) Full read write access to spsr
- 8) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.
  - a) Process blocking b) Context switch
  - c) Time sharing d) None of above



Max. Marks: 70

9) Semaphore are used to \_\_\_\_\_

- a) Signal the occurance of event
- b) Show interfacing between input and output devices
- c) Provide memory management
- d) None of the above
- 10) Which is the core of the OS?

a) Stack

c) Batch OS

- a) shell b) Kernel
- c) Commands d) Scripts
- 11) Race around condition can be avoided by using \_\_\_\_\_.
  - a) Semaphore b) Mutex
  - c) Socket d) both a and b

12) Information about a task is maintained in a \_

b) Translation look aside buffer

Task

- c) Task control block d)
- 13) Which type of following OS the response time is critical?
  - a) Network operating System
- b) Real Time operating Systemd) Unix operating system

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- 14) Which one of the following is an important objective of a real-time operating system?
  - a) Maximization of throughput
  - b) Guaranteeing fairness in task executions
  - c) Minimization of the response time of tasks
  - d) Production of the result of a task within a certain stipulated time period

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## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Draw neat diagram whenever necessary.

## Section – I

## Q.2 Attempt any four.

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- **b)** How many states of ARM according to instruction set? Differentiate between them and Explain four instructions of any one state.
- c) Explain on chip DAC of LPC2148 using associated register.
- d) Why CAN bus protocol is widely used in industrial automation? With the help of diagram explain CAN bus protocol.
- e) Explain the role of AMBA bus in LPC2148.

## Q.3 Attempt any two.

- a) Draw and explain ARM core data flow model of ARM core.
- b) Explain the concept of memory management in ARM core.
- c) Explain SPI and SCI communication protocols.

## Section – II

## Q.4 Attempt any four.

- a) List features of UCOSII RTOs.
- b) Write an embedded C code to demonstrate operation of on-chip DAC of LPC2148.
- c) What are the services provided by desktop or traditional OS?
- d) Write the algorithm to interface to 4X4 matrix keypad to LPC2148 along with necessary registers.
- e) Explain digital camera as embedded system. How to measure it's performance?

## Q.5 Attempt any two.

- a) With suitable example explain the role of semaphore in Operating system.
- **b)** Draw and explain interfacing of 16X2 LCD with LPC2148 for following specifications:
  - 1) Use P0.5 as RS and En respectively (Control bus).
  - 2) Use P1.16 to P1.23 as data bus (D0-D7).

Write an embedded C program to display "Welcome".

c) Explain memory management in RTOs.



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Max. Marks: 56

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# B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

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) Draw neat diagram whenever necessary.

# MCQ/Objective Type Questions

EMBEDDED SYSTEMS

## **Duration: 30 Minutes**

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

- Switching the CPU to another process requires to save state of the old 1) process and loading new process state is called
  - a) Process blocking
  - c) Time sharing
- 2) Semaphore are used to \_\_\_\_\_
  - a) Signal the occurance of event
  - b) Show interfacing between input and output devices
  - c) Provide memory management
  - d) None of the above
- 3) Which is the core of the OS?
  - a) shell b) Kernel
  - Scripts c) Commands d)
- 4) Race around condition can be avoided by using
  - a) Semaphore b) Mutex
    - c) Socket d) both a and b

Information about a task is maintained in a 5) Translation look aside buffer a) Stack b)

- c) Task control block d) Task
- Which type of following OS the response time is critical? 6) Network operating System a)
  - Real Time operating System b) Unix operating system
  - Batch OS d) c)
- 7) Which one of the following is an important objective of a real-time operating system?
  - a) Maximization of throughput
  - b) Guaranteeing fairness in task executions
  - c) Minimization of the response time of tasks
  - Production of the result of a task within a certain stipulated time d) period

Max. Marks: 70

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- d) None of above

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## **SLR-FM-275**

Set Q

- Where is the return address stored after execution of the Branch-and-Link 8) (BL) instruction in ARM? In the register r14 a) In the stack b)
  - c) In the program counter pc
- d)
- 9) NRE cost can be defined by
  - a) The one time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded systems
  - d) None of the above
- ARM uses the thumb\_\_\_\_\_ bit instruction set to improve code density. 10)
  - a) 32 b) 8
  - c) 64 d) 16

The\_\_\_\_\_ directive allows the programmer to specify the memory 11) locations where programs, subroutines or the data will resides.

- a) ALIGN b) AREA
- c) ENTRY d) END
- In LPC 2148 \_\_\_\_\_ pin select register is used to configure port pins 12) P0.0 to P0.1.15.
  - a) PINSEL1 b) PINSEL0
  - c) IODIR2 d) **IOSET0**
- Which of the following instructions are called Program Status Register 13) transfer instructions?
  - a) LDR. STR b) LDM, STM
  - d) MSR, MRS c) MCR, MRC
- 14) A privileged mode allows \_\_\_\_
  - a) Full read access to cpsr
  - c) Full write access to cpsr
- b) Full read write access to cpsr
- Full read write access to spsr d)

None of these

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## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering EMBEDDED SYSTEMS

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## Section – I

## Q.2 Attempt any four.

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- **b)** How many states of ARM according to instruction set? Differentiate between them and Explain four instructions of any one state.
- c) Explain on chip DAC of LPC2148 using associated register.
- d) Why CAN bus protocol is widely used in industrial automation? With the help of diagram explain CAN bus protocol.
- e) Explain the role of AMBA bus in LPC2148.

## Q.3 Attempt any two.

- a) Draw and explain ARM core data flow model of ARM core.
- b) Explain the concept of memory management in ARM core.
- c) Explain SPI and SCI communication protocols.

## Section – II

## Q.4 Attempt any four.

- a) List features of UCOSII RTOs.
- b) Write an embedded C code to demonstrate operation of on-chip DAC of LPC2148.
- c) What are the services provided by desktop or traditional OS?
- d) Write the algorithm to interface to 4X4 matrix keypad to LPC2148 along with necessary registers.
- e) Explain digital camera as embedded system. How to measure it's performance?

## Q.5 Attempt any two.

- a) With suitable example explain the role of semaphore in Operating system.
- **b)** Draw and explain interfacing of 16X2 LCD with LPC2148 for following specifications:
  - 1) Use P0.5 as RS and En respectively (Control bus).
  - 2) Use P1.16 to P1.23 as data bus (D0-D7).

Write an embedded C program to display "Welcome".

c) Explain memory management in RTOs.



Max. Marks: 56

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## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** EMBEDDED SYSTEMS

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## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

1)

Seat

No.

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

- In LPC 2148 pin select register is used to configure port pins
- P0.0 to P0.1.15.
  - a) PINSEL1 PINSEL0 b)
  - d) c) IODIR2 **IOSET0**
- 2) Which of the following instructions are called Program Status Register transfer instructions?
  - a) LDR, STR b)
  - c) MCR, MRC d)

### A privileged mode allows \_\_\_\_ 3)

- a) Full read access to cpsr b)
- c) Full write access to cpsr d)
- 4) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.
  - a) Process blocking
- Context switch None of above
- c) Time sharing d)

### 5) Semaphore are used to \_\_\_\_\_

- a) Signal the occurance of event
- b) Show interfacing between input and output devices
- c) Provide memory management
- d) None of the above
- 6) Which is the core of the OS?
  - Kernel a) shell b)
    - c) Commands d) Scripts
- Race around condition can be avoided by using 7)
  - Mutex a) Semaphore b) c) Socket d) both a and b
- 8) Information about a task is maintained in a
  - a) Stack
  - Task control block d) c)



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- LDM, STM
- MSR, MRS

- Full read write access to cpsr
- Full read write access to spsr

Translation look aside buffer

b)

Task

b)

Max. Marks: 70

R

- 9) Which type of following OS the response time is critical?
  - a) Network operating System c) Batch OS
- b) Unix operating system d)
- Which one of the following is an important objective of a real-time 10) operating system?
  - Maximization of throughput a)
  - b) Guaranteeing fairness in task executions
  - c) Minimization of the response time of tasks
  - d) Production of the result of a task within a certain stipulated time period
- Where is the return address stored after execution of the Branch-and-Link 11) (BL) instruction in ARM?
  - a) In the stack

- In the register r14
- c) In the program counter pc
- 12) NRE cost can be defined by
  - a) The one time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded systems
  - d) None of the above
- ARM uses the thumb\_\_\_\_\_ bit instruction set to improve code density. 13)

b)

- a) 32 b) 8
- c) 64 d) 16

The\_\_\_\_\_ directive allows the programmer to specify the memory 14) locations where programs, subroutines or the data will resides. AREA

- a) ALIGN
- c) ENTRY END d)

- Real Time operating System
- **SLR-FM-275** Set

b) d) None of these
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### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering EMBEDDED SYSTEMS

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#### Section – I

#### Q.2 Attempt any four.

- a) What are design metrics? Explain any one in detail. How to optimize design metrics?
- **b)** How many states of ARM according to instruction set? Differentiate between them and Explain four instructions of any one state.
- c) Explain on chip DAC of LPC2148 using associated register.
- d) Why CAN bus protocol is widely used in industrial automation? With the help of diagram explain CAN bus protocol.
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- b) Explain the concept of memory management in ARM core.
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- a) List features of UCOSII RTOs.
- b) Write an embedded C code to demonstrate operation of on-chip DAC of LPC2148.
- c) What are the services provided by desktop or traditional OS?
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- a) With suitable example explain the role of semaphore in Operating system.
- **b)** Draw and explain interfacing of 16X2 LCD with LPC2148 for following specifications:
  - 1) Use P0.5 as RS and En respectively (Control bus).
  - 2) Use P1.16 to P1.23 as data bus (D0-D7).

Write an embedded C program to display "Welcome".

c) Explain memory management in RTOs.

\_\_\_\_\_

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Max. Marks: 56

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

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## MCQ/Objective Type Questions

EMBEDDED SYSTEMS

### **Duration: 30 Minutes**

Seat No.

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

b)

d)

- Which is the core of the OS? 1)
  - a) shell b)
  - c) Commands d) Scripts
- 2) Race around condition can be avoided by using \_
  - a) Semaphore b) Mutex
  - c) Socket d) both a and b

Information about a task is maintained in a 3) Translation look aside buffer a) Stack

- c) Task control block d) Task 4) Which type of following OS the response time is critical?
  - a) Network operating System b)
    - c) Batch OS
- Which one of the following is an important objective of a real-time 5) operating system?
  - a) Maximization of throughput
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- Where is the return address stored after execution of the Branch-and-Link 6) (BL) instruction in ARM?
  - a) In the stack In the register r14 b)
  - d) None of these c) In the program counter pc
- 7) NRE cost can be defined by \_
  - a) The one time monetary cost of designing the system
  - b) Life time cost of system
  - Depends upon embedded systems c)
  - d) None of the above

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Max. Marks: 70

Marks: 14

- Kernel

Real Time operating System

Unix operating system

8) ARM uses the thumb\_\_\_\_\_ bit instruction set to improve code density.

- a) 32 b) 8
- c) 64 d) 16
- 9) The\_\_\_\_\_ directive allows the programmer to specify the memory locations where programs, subroutines or the data will resides.
   a) ALIGN
   b) AREA
  - c) ENTRY d) END
- 10) In LPC 2148 \_\_\_\_\_ pin select register is used to configure port pins P0.0 to P0.1.15.
  - a) PINSEL1 b) PINSEL0
  - c) IODIR2 d) IOSET0
- 11) Which of the following instructions are called Program Status Register transfer instructions?
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  - c) MCR, MRC d) MSR, MRS

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- a) Full read access to cpsr
- b) Full read write access to cpsr

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Set S

- c) Full write access to cpsr d) Full read write access to spsr
- 13) Switching the CPU to another process requires to save state of the old process and loading new process state is called \_\_\_\_\_.
  - a) Process blocking
- b) Context switch
- c) Time sharing
- d) None of above
- 14) Semaphore are used to \_\_\_\_\_.
  - a) Signal the occurance of event
  - b) Show interfacing between input and output devices
  - c) Provide memory management
  - d) None of the above

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#### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering EMBEDDED SYSTEMS

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#### Section – I

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c) Explain memory management in RTOs.

Max. Marks: 56

16

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# B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication 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.

WIRELESS SENSOR NETWORK

- 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 and rewrite the sentence. 14

- 1) routes user queries or commands to appropriate nodes in sensor.
  - a) bridge c) Node

- gateway b)
  - d) None of these
- 2) is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
  - a) sensor c) routing

b) sensor node

Schedule

d) none of the above

b)

d)

- \_\_\_\_\_ based protocol do not divide channel into sub-channels or pre-allocate 3) the channel for each node use.
  - a) Contention
  - c) RFID
- 4) LEACH is example of \_\_\_\_\_. a) Contention
- b) Schedule
  - d) None of the above

None of the above

- Main role of time synchronization in distributed networks is to \_\_\_\_\_. 5)
  - Ensure common time scale for all network nodes a)
  - b) Provide right temporal co-ordination among all nodes
  - c) both a) & b)

c) RFID

7)

d) None of above

#### 6) In wireless adhoc network

- a) access point is not required access point is required b) none of the above c) nodes are not required d)
- Clustering in WSN contribute to \_
- System scalability b) a) c) Energy efficiency
- In WSNs, \_\_\_\_\_ mobility is viewed. 8)
  - a) Node b)
  - Sink c) Event All of the above d)
- 9) RFID stands for \_\_\_\_\_
  - a) Radio Frequency Identification Radio first identification b) d) None of above
  - c) both a)&b)

- Life time
- All of above d)

Marks: 14

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Max. Marks: 70



- 10) \_\_\_\_\_ is the main concern in designing time synchronization protocols.
   a) Energy efficiency
   b) Power consumption
  - a) Energy efficiencyc) Both (a) and (b)

a) network topology

- b) Power consumptiond) None of the above
- 11) Performance of time synchronization protocol is closely related with \_\_\_\_\_.
  - b) power
  - c) frames d) none of the above
- 12) \_\_\_\_\_ MAC protocol is widely used in modern cellular communication systems.
  - a) TDMA c) CDMA

- b) FDMA
- d) All of the above
- 13) \_\_\_\_\_ is the interference caused when radio waves of one device distorts the waves of another.
  - a) EMI

- b) EMC
- c) Both (a) and (b)
- d) None of the above
- 14) \_\_\_\_\_ is the application of RFID.
  - a) Identification and data capture
  - c) Massive incidents
- b) Health-care
- d) All of the above

## Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering WIRELESS SENSOR NETWORK

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

**Instructions:** 1) All questions are compulsory.

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#### Section – I

#### Q.2 Attempt any four.

- a) What are the applications of WSN and Mobile adhoc networks?
- b) Explain the various hardware components of Single Node architecture.
- c) Explain Figures of Merit.
- d) Explain the optimization goals of network architecture.
- e) Write a short note on clustering.

#### Q.3 Attempt any two.

- a) Explain in brief about energy Consumption of Sensor nodes.
- **b)** What are the major issues and challenges that need to be considered for designing adhoc wireless system?
- c) Explain the various Enabling Technologies for Wireless Sensor Networks. Mention the various applications of WSN.

#### Section – II

#### Q.4 Attempt any four.

- a) Explain the concept of low duty cycle in MAC protocol
- b) Explain any one schedule based protocol.
- c) Write a note on Antenna directivity and gain.
- d) Explain the use of RFID in health care.
- e) What are the different aspects of EMC?

#### Q.5 Attempt any two.

- a) Explain in brief any two contention based protocols.
- **b)** Explain EMC Requirements for Electronic Systems.
- c) Explain the application of RFID in identification and data capture.



Max. Marks: 56

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No.				
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#### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** WIRELESS SENSOR NETWORK

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### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

3)

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

- 1) In WSNs, mobility is viewed.
  - a) Node
  - c) Event d)
- 2) RFID stands for \_\_\_\_
  - a) Radio Frequency Identification Radio first identification b) None of above
  - c) both a)&b) d)
  - \_\_\_\_ is the main concern in designing time synchronization protocols.
  - a) Energy efficiency Power consumption b)
    - c) Both (a) and (b) d) None of the above
- 4) Performance of time synchronization protocol is closely related with \_\_\_\_\_.
  - a) network topology b) power
  - d) none of the above c) frames
- 5) \_\_\_\_ MAC protocol is widely used in modern cellular communication systems. FDMA b)
  - a) TDMA c) CDMA
    - All of the above d)
- is the interference caused when radio waves of one device distorts 6) the waves of another.
  - a) EMI b) EMC
  - c) Both (a) and (b) d) None of the above
- 7) \_ is the application of RFID.

c)

Node

- a) Identification and data capture b) Health-care
- c) Massive incidents All of the above d)
- \_ routes user queries or commands to appropriate nodes in sensor. 8) a) bridge
  - gateway b) d) None of these
- 9) is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
  - a) sensor b) sensor node
  - routing d) none of the above c)

Max. Marks: 70

Marks: 14

- b) Sink All of the above





10) \_\_\_\_\_ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node use.

- a) Contention
- c) RFID
- b) Schedule
- d) None of the above

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Set

- 11) LEACH is example of \_\_\_\_\_.a) Contention
- b) Schedule
- c) RFID d) None of the above
- 12) Main role of time synchronization in distributed networks is to \_\_\_\_\_.
  - a) Ensure common time scale for all network nodes
  - b) Provide right temporal co-ordination among all nodes
  - c) both a) & b)
  - d) None of above

#### 13) In wireless adhoc network \_\_\_\_

- a) access point is not required b)
- c) nodes are not required
- 14) Clustering in WSN contribute to \_\_\_\_
  - a) System scalability
  - c) Energy efficiency

- b) access point is requiredd) none of the above
  - \_.
- b) Life time
- d) All of above

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### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering WIRELESS SENSOR NETWORK

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## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

2)

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No.

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

b)

d)

Sink

access point is required

none of the above

None of the above

- Main role of time synchronization in distributed networks is to . 1)
  - Ensure common time scale for all network nodes a)
  - Provide right temporal co-ordination among all nodes b)
  - c) both a) & b)
  - d) None of above
  - a) access point is not required
    - c) nodes are not required
- Clustering in WSN contribute to \_ 3)

In wireless adhoc network \_\_\_\_

- a) System scalability Life time b)
- c) Energy efficiency d) All of above
- 4) In WSNs, \_\_\_\_\_ mobility is viewed.
  - a) Node b) c) Event
    - d) All of the above
- 5) RFID stands for \_\_\_\_
  - a) Radio Frequency Identification Radio first identification b)
  - c) both a)&b) d) None of above
- 6) is the main concern in designing time synchronization protocols.
  - a) Energy efficiency b) Power consumption
  - c) Both (a) and (b) d) None of the above
- 7) Performance of time synchronization protocol is closely related with \_\_\_\_\_.
  - a) network topology power b)
    - c) frames d) none of the above
- 8) MAC protocol is widely used in modern cellular communication systems.
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- is the interference caused when radio waves of one device distorts 9) the waves of another. b) FMC

d)

- a) EMI C) Both (a) and (b)



Max. Marks: 70

Marks: 14

10) \_\_\_\_\_ is the application of RFID.

a) Identification and data capture

- c) Massive incidents
- b) Health-care

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- d) All of the above
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- 13) \_\_\_\_\_ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node use.
  - a) Contention

- b) Schedule
- d) None of the above
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  - c) RFID

c) RFID

- b) Schedule
- d) None of the above

## Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering WIRELESS SENSOR NETWORK

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

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four.

- a) What are the applications of WSN and Mobile adhoc networks?
- **b)** Explain the various hardware components of Single Node architecture.
- c) Explain Figures of Merit.
- d) Explain the optimization goals of network architecture.
- e) Write a short note on clustering.

#### Q.3 Attempt any two.

- a) Explain in brief about energy Consumption of Sensor nodes.
- b) What are the major issues and challenges that need to be considered for designing adhoc wireless system?
- c) Explain the various Enabling Technologies for Wireless Sensor Networks. Mention the various applications of WSN.

#### Section – II

#### Q.4 Attempt any four.

- a) Explain the concept of low duty cycle in MAC protocol
- b) Explain any one schedule based protocol.
- c) Write a note on Antenna directivity and gain.
- d) Explain the use of RFID in health care.
- e) What are the different aspects of EMC?

#### Q.5 Attempt any two.

- a) Explain in brief any two contention based protocols.
- **b)** Explain EMC Requirements for Electronic Systems.
- c) Explain the application of RFID in identification and data capture.



Max. Marks: 56

12

16

12

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** WIRELESS SENSOR NETWORK

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.

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### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

5)

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No.

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

1) is the main concern in designing time synchronization protocols. Power consumption

b)

b)

- a) Energy efficiency c) Both (a) and (b)
- None of the above d)

#### Performance of time synchronization protocol is closely related with \_\_\_\_\_. 2)

- a) network topology
- c) frames d) none of the above
- 3) MAC protocol is widely used in modern cellular communication systems.
  - a) TDMA
  - All of the above c) CDMA d)
- 4) is the interference caused when radio waves of one device distorts the waves of another.
  - EMI a)
  - Both (a) and (b) c)
  - is the application of RFID.
    - Identification and data capture a)
      - c) Massive incidents All of the above d)
- 6) routes user queries or commands to appropriate nodes in sensor.

b)

- a) bridge gateway b)
- c) Node None of these d)
- 7) \_\_\_\_ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
  - sensor b) a) sensor node c) routing d) none of the above
- based protocol do not divide channel into sub-channels or pre-allocate 8) the channel for each node use.
  - a) Contention b) Schedule
  - c) RFID None of the above d)



Max. Marks: 70

Marks: 14

**SLR-FM-276** 



power

- **FDMA**
- b)
- - EMC
  - None of the above

Health-care

b) d)

				Set	S
9)	LEACH is example of a) Contention c) RFID	b) d)	Schedule None of the above		
10)	<ul> <li>Main role of time synchronization in</li> <li>a) Ensure common time scale for a</li> <li>b) Provide right temporal co-ordina</li> <li>c) both a) &amp; b)</li> <li>d) None of above</li> </ul>	distrib all netv ition a	outed networks is to work nodes mong all nodes		
11)	<ul><li>In wireless adhoc network</li><li>a) access point is not required</li><li>c) nodes are not required</li></ul>	b) d)	access point is required none of the above		
12)	<ul><li>Clustering in WSN contribute to</li><li>a) System scalability</li><li>c) Energy efficiency</li></ul>	b) d)	Life time All of above		
13)	In WSNs, mobility is viewed. a) Node c) Event	b) d)	Sink All of the above		
14)	<ul><li>RFID stands for</li><li>a) Radio Frequency Identification</li><li>c) both a)&amp;b)</li></ul>	b) d)	Radio first identification None of above		

### Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering WIRELESS SENSOR NETWORK

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

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#### Section – I

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- b) Explain the various hardware components of Single Node architecture.
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- c) Explain the various Enabling Technologies for Wireless Sensor Networks. Mention the various applications of WSN.

#### Section – II

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- b) Explain any one schedule based protocol.
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- d) Explain the use of RFID in health care.
- e) What are the different aspects of EMC?

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- a) Explain in brief any two contention based protocols.
- **b)** Explain EMC Requirements for Electronic Systems.
- c) Explain the application of RFID in identification and data capture.



Max. Marks: 56

12

16

16

## Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PATTEERN RECOGNITION

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) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

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

- \_ learning number of classes are known. 1) In
  - Unsupervised a) Supervised b)
  - Both of these d) None of these C)
- The density estimation in which the volume V<sub>n</sub> is shrinked according to 2) function  $V_n = \frac{1}{\sqrt{n}}$  is called
  - a) Kn-nearest neighbor
    - Parzen window c)
- 3) Determining sequence of hidden states for given HMM and visible states is called **Decoding problem** b)

b)

d)

- a) Evaluation problem
- c) Learning problem d) All of these
- Production rules represent a wide variety of knowledge representations 4) that are based on\_ Action only
  - a) Condition only
- b) d)
- c) condition-action pairs
- Triangle Inequality property of distance metric is given as 5) b)  $D(a, b) \ge 0$ 
  - a)  $D(a,b) + D(b,c) \ge D(a,c)$
  - c) D(a,b) = D(b,a)d) None of these
- In Statistical pattern recognition, the block 'Construction of formal 6) description' is based on
  - a) The experience of the designer
  - Intuition of the designer b)
  - c) Both a and b
  - d) Neither a and b
- A random variable that takes on an infinite number of values is known as 7) а
  - Independent random variable a)
  - Continuous random variable C)
- b) Discrete random variable
- None of the above d)

**Bayesian estimation** 

All of the above

None of these



Marks: 14

14



Max. Marks: 70

**SLR-FM-277** 

#### 8) Our productions of any sequence is described by the transition probabilities

- a)  $P(\omega_i(t+1)|\omega_i(t)) = b_{ij}$
- c)  $P(\omega_i(t+1)|\omega_i(t)) = a_{ij}$
- Parzen-window classifier depends upon the choice of 9)
  - a) No. of sample points Window function b)
  - c) Both a and b d) None of the above

#### 10) Wards method is also named as the Method.

- Maximum of squared variance Minimum of squared variance b) a)
  - Maximum Variance d) **Minimum Variance** c)
- 11) Simulated annealing consists of downhill iteration steps combined with controlled uphill steps that make it possible to escape from\_
  - a) local minima b) global minima
  - c) local maxima d) global maxima

#### Classifier that places a pattern in one of only two categories is called 12)

- a) Chotomizer Trichomizer b) c) Economizer d) Dichotomizer
- Syntactic Recognition Algorithm consists of following steps 13)
  - a) Learning, Recognition, Classification
  - b) Learning, Construct a description grammar, Recognition, Classification
  - Construct a description grammar, Recognition, Classification c)
  - d) Learning, Construct a description grammar, Classification
- 14) The loss function  $\lambda(\alpha_i | w_i)$  describes the loss incurred for taking action  $\alpha_i$ when the state of the nature is  $w_i$  has value equal to \_\_\_\_\_.
  - a) 0 when i = jb)
    - d)
- 0 when  $i \neq j$
- 2 when i = i

- c) 1 when i = j

- b)  $P(\omega_i(t+1)|\omega_i(t)) = b_{ik}$ d)  $P(v_k(t)|\omega_j(t)) = b_{jk}$
- Set

**SLR-FM-277** 

## Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PATTEERN RECOGNITION (Elective – II)

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

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any three

a) Suppose that the Random variables X & Y have the joint density function defined by f(x, y) = c(2x + y)= 0 2 < x < 6 & 0 < y < 5otherwise

Find : 1) constant c, 2) P(X > 3, Y > 2)

- b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where  $\mu$  is unknown and covariance matrix ( $\Sigma$ ) is known.
- c) Write a short note on supervised learning.
- d) Explain accuracy and computational complexity of classifier.
- e) Draw the histogram of Lightness feature for the fish categorization and explain in brief.

#### Q.3 Attempt any two.

- a) Explain the equation of conditional risk and overall risk. Comment on the condition at which overall risk is called as Bayes Risk.
- **b)** The joint probability function of two random variable X and Y is given by

 $f(x, y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$ , otherwise

= 0 Find :

- 1) the value of c2) marginal probability functions of X & Y3) f(y/1),4) f(X/2)
- c) Explain Hidden Markov models (HMM) and give HMM forward algorithm.

#### Section – II

#### Q.4 Attempt any three.

- a) Write a note on Probabilistic Neural Network.
- **b)** Write a note on Agglomerative Clustering.
- c) What is K- nearest neighbor rule?
- d) Explain Forgy's clustering.
- e) Explain feed forward network

#### Q.5 Attempt any two.

- a) Explain fuzzy Optimization technique in recognition.
- **b)** Write a note on Neural Networks.
- c) Starting from fundamentals derive an expression for density estimation

$$P_n(x) = \frac{K_n/n}{V_n}$$

Set P

Max. Marks: 56

16

12

16

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PATTEERN RECOGNITION

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) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

Seat No.

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

- Our productions of any sequence is described by the transition 1) probabilities
  - a)  $P(\omega_j(t+1)|\omega_i(t)) = b_{ij}$  b)  $P(\omega_j(t+1)|\omega_i(t)) = b_{jk}$ d)  $P(v_k(t)|\omega_j(t)) = b_{jk}$  $P(\omega_i(t+1)|\omega_i(t)) = a_{ij}$ c)

#### 2) Parzen-window classifier depends upon the choice of

Window function a) No. of sample points b) c) Both a and b None of the above d)

#### 3) Wards method is also named as the Method.

- Maximum of squared variance b) Minimum of squared variance a)
- Maximum Variance **Minimum Variance** c) d)
- 4) Simulated annealing consists of downhill iteration steps combined with controlled uphill steps that make it possible to escape from\_
  - a) local minima global minima b) global maxima d)
  - c) local maxima
- Classifier that places a pattern in one of only two categories is called 5)
  - a) Chotomizer Trichomizer b)
  - c) Economizer d) Dichotomizer
- 6) Syntactic Recognition Algorithm consists of following steps
  - Learning, Recognition, Classification a)
  - b) Learning, Construct a description grammar, Recognition, Classification
  - Construct a description grammar, Recognition, Classification c)
  - d) Learning, Construct a description grammar, Classification

#### The loss function $\lambda(\alpha_i | w_i)$ describes the loss incurred for taking action $\alpha_i$ 7) when the state of the nature is $w_i$ has value equal to \_\_\_\_\_.

d)

None of these

- a) 0 when i = i2 when i = jb)
- C) 1 when i = jd) 0 when  $i \neq j$
- 8) \_\_\_\_ learning number of classes are known. In b) Supervised
  - Unsupervised a)
    - Both of these c)

Max. Marks: 70

Marks: 14



- The density estimation in which the volume  $V_n$  is shrinked according to 9) function  $V_n = \frac{1}{\sqrt{n}}$  is called
  - a) Kn-nearest neighbor
  - Parzen window c)
- **Bayesian estimation** b)

Set Q

- d)
- All of the above
- Determining sequence of hidden states for given HMM and visible states 10) is called
  - Evaluation problem a) b) **Decoding problem** 
    - Learning problem All of these d)
- Production rules represent a wide variety of knowledge representations 11) that are based on\_
  - a) Condition only b) Action only
  - c) condition-action pairs None of these d)
- 12) Triangle Inequality property of distance metric is given as
  - a)  $D(a,b) + D(b,c) \ge D(a,c)$ b)  $D(a,b) \ge 0$
  - d) None of these D(a,b) = D(b,a)C)
- 13) In Statistical pattern recognition, the block 'Construction of formal description' is based on
  - The experience of the designer a)
  - b) Intuition of the designer
  - c) Both a and b

C)

a)

- d) Neither a and b
- A random variable that takes on an infinite number of values is known as 14) a
  - Independent random variable b)
  - Continuous random variable c)
- Discrete random variable
- d) None of the above

## Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PATTEERN RECOGNITION (Elective – II)

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

**Instructions:** 1) All questions are compulsory.

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- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any three

a) Suppose that the Random variables X & Y have the joint density function defined by f(x, y) = c(2x + y)= 0 2 < x < 6 & 0 < y < 5otherwise

Find : 1) constant c, 2) P(X > 3, Y > 2)

- b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where  $\mu$  is unknown and covariance matrix ( $\Sigma$ ) is known.
- c) Write a short note on supervised learning.
- d) Explain accuracy and computational complexity of classifier.
- e) Draw the histogram of Lightness feature for the fish categorization and explain in brief.

#### Q.3 Attempt any two.

- a) Explain the equation of conditional risk and overall risk. Comment on the condition at which overall risk is called as Bayes Risk.
- **b)** The joint probability function of two random variable X and Y is given by

 $f(x, y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$ , otherwise

= 0 Find :

- 1) the value of c2) marginal probability functions of X & Y3) f(y/1),4) f(X/2)
- c) Explain Hidden Markov models (HMM) and give HMM forward algorithm.

#### Section – II

#### Q.4 Attempt any three.

- a) Write a note on Probabilistic Neural Network.
- **b)** Write a note on Agglomerative Clustering.
- c) What is K- nearest neighbor rule?
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#### Q.5 Attempt any two.

- a) Explain fuzzy Optimization technique in recognition.
- **b)** Write a note on Neural Networks.
- c) Starting from fundamentals derive an expression for density estimation

$$P_n(x) = \frac{K_n/n}{V_n}$$



Max. Marks: 56

16

12

16

# Seat

#### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PATTEERN RECOGNITION

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.

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### MCQ/Objective Type Questions

d)

**Duration: 30 Minutes** 

No.

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

- Triangle Inequality property of distance metric is given as 1)  $D(a,b) \ge 0$ b)
  - $D(a,b) + D(b,c) \ge D(a,c)$ a)
  - D(a,b) = D(b,a)C)
- 2) In Statistical pattern recognition, the block 'Construction of formal description' is based on
  - a) The experience of the designer
  - b) Intuition of the designer
  - Both a and b C)
  - d) Neither a and b

#### A random variable that takes on an infinite number of values is known as 3) a\_

- a) Independent random variable Discrete random variable b)
- c) Continuous random variable d) None of the above
- 4) Our productions of any sequence is described by the transition probabilities
  - $P(\omega_i(t+1)|\omega_i(t)) = b_{ij}$ a)
  - $P(\omega_i(t+1)|\omega_i(t)) = a_{ij}$ c)
- Parzen-window classifier depends upon the choice of 5)
  - a) No. of sample points b) Window function
  - c) Both a and b None of the above d)
- Wards method is also named as the Method. 6)
  - a) Maximum of squared variance b) Minimum of squared variance
    - Maximum Variance **Minimum Variance** c) d)
- Simulated annealing consists of downhill iteration steps combined with 7) controlled uphill steps that make it possible to escape from\_\_\_\_
  - a) local minima global minima b)
  - c) local maxima d) global maxima
- 8) Classifier that places a pattern in one of only two categories is called
  - a) Chotomizer Economizer c)
- b) Trichomizer d) Dichotomizer





Max. Marks: 70

**SLR-FM-277** 

b)  $P\left(\omega_{j}(t+1)|\omega_{i}(t)\right) = b_{jk}$ 

None of these

d)  $P(v_k(t)|\omega_j(t)) = b_{jk}$ 

Marks: 14

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- 9) Syntactic Recognition Algorithm consists of following steps\_\_\_\_
  - a) Learning, Recognition, Classification
  - b) Learning, Construct a description grammar, Recognition, Classification
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  - 2 when i = ja) 0 when i = jb)
  - 1 when i = jd) 0 when  $i \neq j$ C)
- 11) In \_\_\_\_\_ learning number of classes are known.
  - a) Unsupervised b) Supervised Both of these C)
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- The density estimation in which the volume V<sub>n</sub> is shrinked according to 12) function  $V_n = \frac{1}{\sqrt{n}}$  is called
  - a) Kn-nearest neighbor

c) Parzen window

- **Bayesian estimation** b) d) All of the above
- 13) Determining sequence of hidden states for given HMM and visible states is called
  - a) Evaluation problem
- Decoding problem b)

All of these

**SLR-FM-277** 

Set

- c) Learning problem d)
- Production rules represent a wide variety of knowledge representations 14) that are based on
  - a) Condition only

- Action only b)
- c) condition-action pairs
- d) None of these

## Seat No.

### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PATTEERN RECOGNITION (Elective – II)

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

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#### Section – I

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- d) Explain Forgy's clustering.
- e) Explain feed forward network

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$$P_n(x) = \frac{K_n/n}{V_n}$$



Max. Marks: 56

16

12

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#### B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PATTEERN RECOGNITION

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

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### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

a)

c)

Seat No.

- Choose the correct alternatives from the options and rewrite the Q.1 sentence.
  - Wards method is also named as the 1) Method.
    - Maximum of squared variance b) Minimum of squared variance
    - Maximum Variance d) **Minimum Variance**

#### Simulated annealing consists of downhill iteration steps combined with 2) controlled uphill steps that make it possible to escape from

- a) local minima global minima b)
- c) local maxima global maxima d)
- 3) Classifier that places a pattern in one of only two categories is called
  - Trichomizer Chotomizer b) a)
  - c) Economizer d) Dichotomizer
- Syntactic Recognition Algorithm consists of following steps\_\_\_\_\_ 4)
  - Learning, Recognition, Classification a)
  - Learning, Construct a description grammar, Recognition, b) Classification
  - Construct a description grammar, Recognition, Classification C)
  - d) Learning, Construct a description grammar, Classification

#### The loss function $\lambda(\alpha_i | w_i)$ describes the loss incurred for taking action $\alpha_i$ 5) when the state of the nature is $w_i$ has value equal to .

		,		
a)	0 when $i = j$	b	) 2 v	when i

- c) 1 when i = jd) 0 when  $i \neq j$
- In \_\_\_\_\_ learning number of classes are known. 6)
  - a) Unsupervised b)
    - Both of these d) c)

#### The density estimation in which the volume V<sub>n</sub> is shrinked according to 7) function $V_n = \frac{1}{\sqrt{n}}$ is called

- Kn-nearest neighbor a)
- **Bayesian estimation** b) All of the above Parzen window d) C)
- 8) Determining sequence of hidden states for given HMM and visible states is called
  - a) Evaluation problem Decoding problem b)
  - c) Learning problem All of these d)





Marks: 14

14

Max. Marks: 70

= i

- Supervised
- None of these

9) Production rules represent a wide variety of knowledge representations that are based on

- a) Condition only
- b) Action only

**SLR-FM-277** 

Set

- c) condition-action pairs d) None of these
- 10) Triangle Inequality property of distance metric is given as
  - $D(a, b) + D(b, c) \ge D(a, c)$ b)  $D(a,b) \ge 0$
  - d) None of these D(a,b) = D(b,a)
- In Statistical pattern recognition, the block 'Construction of formal 11) description' is based on
  - a) The experience of the designer
  - b) Intuition of the designer
  - Both a and b c)

a)

C)

- d) Neither a and b
- 12) A random variable that takes on an infinite number of values is known as а

d)

- a) Independent random variable
- c) Continuous random variable
- b) Discrete random variable None of the above
- Our productions of any sequence is described by the transition 13) probabilities

a) 
$$P(\omega_i(t+1)|\omega_i(t)) = b_{ij}$$

- c)  $P(\omega_j(t+1)|\omega_i(t)) = a_{ij}$  d)  $P(v_k(t)|\omega_j(t)) = b_{jk}$
- b)  $P(\omega_i(t+1)|\omega_i(t)) = b_{jk}$
- Parzen-window classifier depends upon the choice of 14)
  - a) No. of sample points Both a and b c)
- b) Window function
- None of the above d)

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PATTEERN RECOGNITION (Elective – II)

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

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any three

Seat No.

> a) Suppose that the Random variables X & Y have the joint density function defined by f(x,y) = c(2x + y)= 0 2 < x < 6 & 0 < y < 5otherwise

Find : 1) constant c, 2) P(X > 3, Y > 2)

- b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where  $\mu$  is unknown and covariance matrix ( $\Sigma$ ) is known.
- c) Write a short note on supervised learning.
- d) Explain accuracy and computational complexity of classifier.
- e) Draw the histogram of Lightness feature for the fish categorization and explain in brief.

#### Q.3 Attempt any two.

- a) Explain the equation of conditional risk and overall risk. Comment on the condition at which overall risk is called as Bayes Risk.
- **b)** The joint probability function of two random variable X and Y is given by

 $f(x, y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$ , otherwise

= 0 Find :

- 1) the value of c2) marginal probability functions of X & Y3) f(y/1),4) f(X/2)
- c) Explain Hidden Markov models (HMM) and give HMM forward algorithm.

#### Section – II

#### Q.4 Attempt any three.

- a) Write a note on Probabilistic Neural Network.
- **b)** Write a note on Agglomerative Clustering.
- c) What is K- nearest neighbor rule?
- d) Explain Forgy's clustering.
- e) Explain feed forward network

#### Q.5 Attempt any two.

- a) Explain fuzzy Optimization technique in recognition.
- **b)** Write a note on Neural Networks.
- c) Starting from fundamentals derive an expression for density estimation

$$P_n(x) = \frac{K_n/n}{V_n}$$



Max. Marks: 56

16

12

12

## Seat No.

#### B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION

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 Page No.3. Each question carries one mark.
2) Assume suitable data if necessary.

 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** 

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
  - The Addressing that permits the content in internal register of the CPU & I/O to be accessed as memory location is \_\_\_\_\_.
    - a) Memory Mapped b)
    - c) Circular Mode d) Bit Reversed Addressing

### 2) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.

- a) Indirect addressingc) Memory Mapped
- b) Circular Moded) Bit Reversed Addressing

Indirect addressing

- 3) The number of instruction cycles required for executing a program in a microprocessor with no pipelining is \_\_\_\_\_.
  - a) 4 b) 2 c) 3 d) 1
- 4) A P-DSP has four pipeline stages and uses four phase clock. The number of clock cycles required for executing a program with 25 instruction is \_\_\_\_\_.
  - a) 29 b) 28
  - c) 25 d) 26
- 5) VLIW architecture differs from conventional P-DSP in which of the following aspects \_\_\_\_\_.
  - a) Instruction cache
  - b) Number of Functional Units
  - c) Using Pipelining
  - d) A single word fetched from memory has a number of instructions
- Number of memory accesses /clock/period that can be achieved using on chip DRAM of a P-DSP is \_\_\_\_\_.
  - a) 1 b) 2
  - c) 4 d) 3
- 7) The features in which PDSP is superior to advanced microprocessors is \_\_\_\_\_.
  - a) Real time I/O capability b) Low cost
  - c) Low Power d) Computational Speed



Max. Marks: 70

Marks: 14

			Set	Ρ
8)	The Memory mapped direct address page.	ing m	ode is used to access data in	
	a) 0 c) 511	b)	1	
9)	The register which holds the address	s of th	e current data memory page	
	is a) ARP c) ARB	b) d)	DP None	
10)	The size of the C6X CPU is a) 16-bit c) 40-bit	b) d)	32-bit 64-bit	
11)	The floating point devices in C6X pro a) C67X c) C64X	bcess b) d)	ors are C62X C64X & C62X	
12)	The C6X processor based on a) Modified Harvard c) Veloci TI	archi b) d)	tecture. Advanced Harvard Davinci	
13)	C54X assembler directive res and when a label is used with this di address of the first word of the block a) .bes c) .word	erves rective reser b) d)	and initializes n bits of memory e, the label is assigned the ved. .space .data	
14)	The external SRAM capacity in C540	)2 kit	is words and requires	
	a) 64K,1 c) 256K,1	b) d)	64K,7 256K,7	

256K,7

**SLR-FM-278** 

Seat No.

### B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION

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

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data if necessary.

### SECTION - I

#### Q.2 Attempt any four:

- a) Explain in detail signals and coefficients in DSP Systems.
- **b)** Draw and explain briefly VLIW architecture.
- c) Which are the special addressing modes of p-DSPs with suitable example?
- d) Explain multiplier and multiplier accumulator of DSP.
- e) Explain in detail D/A conversion errors in DSP Systems.

#### Q.3 Attempt any two:

- a) Draw & explain Architecture of TMS320C5X Processor.
- b) Draw & Explain Block Diagram of DSP Starter Kit.
- c) Describe briefly Pipeline structure and operation TMS320C5X Processor.

#### SECTION – II

#### Q.4 Attempt any four:

- a) Explain in detail Data Addressing Modes of TMS320C54XX DSP.
- **b)** Explain the steps required for running a C54X assembly language in code composer studio.
- c) Write short note on C54X.
- d) Compare the feature of TMS320C6X and DSP563XX Processor.
- e) Describe briefly Interrupts of TMS320C54XX Processor.

#### Q.5 Attempt any two.

- a) Write the Program for convolutional codes using C54X program.
- **b)** Explain Pipeline operation in C54X.
- c) Draw & explain Architecture of Motorola DSP563XX.



Max. Marks: 56

16

12

16

GPA) Examination Nov/Dec-2019

#### B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION

**Instructions:** 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3. Each question carries one mark.

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

Seat

No.

			2) Assume suitable dat 3) Answer MCQ/Object Mention, Q.P. Set (F	a if necessa tive type que 2/Q/R/S) on 1	ry. stior Fop (	ns on page No.3 only. Don't forge of page.	et to
Dura	tion: 3	60 M	MCQ/Obj inutes	ective Typ	e C	Questions Mark	s: 14
Q.1	Choo	ose '	the correct alternativ	es from the	opti	ions and rewrite the	14
	3em 1)	The pag	e. e Memory mapped dire ge.	ect addressin	ig m	ode is used to access data in	
		a) c)	0 511		b) d)	1 512	
	2)	The	e register which holds t	the address of	of th	e current data memory page	
		a) c)	ARP ARB	t c	o) d)	DP None	
	3)	The a) c)	e size of the C6X CPU 16-bit 40-bit	is I	b) d)	32-bit 64-bit	
	4)	The a) c)	e floating point devices C67X C64X	in C6X proc	esso b) d)	ors are C62X C64X & C62X	
	5)	The a) c)	e C6X processor based Modified Harvard Veloci TI	d ona k c	archi c) d)	tecture. Advanced Harvard Davinci	
	6)	and add a) c)	C54X assembler d d when a label is used dress of the first word o .bes .word	irective reservent with this dire of the block r l	rves ective eser b) d)	and initializes n bits of memory e, the label is assigned the ved. .space .data	
	7)	The a) c)	e external SRAM capa wait states. 64K,1 256K,1	city in C5402 k c	2 kit o) d)	is words and requires 64K,7 256K,7	

Max. Marks: 70

Set Q

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			SLR-FM-278
			Set Q
8)	The Addressing that permits the conte I/O to be accessed as memory locatio a) Memory Mapped b c) Circular Mode c	in internal regist s Indirect addres Bit Reversed A	er of the CPU & ssing Addressing
9)	The addressing mode that is convenie a) Indirect addressing b c) Memory Mapped c	for FFT computa Circular Mode Bit Reversed A	ition is
10)	The number of instruction cycles required microprocessor with no pipelining isa) 4	d for executing a  2 1	program in a
11)	A P-DSP has four pipeline stages and clock cycles required for executing a p a) 29 b c) 25 c	ses four phase cl gram with 25 ins 28 26	ock. The number of truction is
12)	<ul> <li>VLIW architecture differs from convention following aspects</li> <li>a) Instruction cache</li> <li>b) Number of Functional Units</li> <li>c) Using Pipelining</li> <li>d) A single word fetched from memore</li> </ul>	nal P-DSP in whi has a number of	ch of the instructions
13)	Number of memory accesses /clock/pe chip DRAM of a P-DSP is a) 1	od that can be ad 2 3	chieved using on
14)	The features in which PDSP is superior is a) Real time I/O capability	to advanced micr Low cost	oprocessors

c) Low Power

d) Low costd) Computational Speed

Seat No.

### B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION

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

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data if necessary.

### SECTION - I

#### Q.2 Attempt any four:

- a) Explain in detail signals and coefficients in DSP Systems.
- **b)** Draw and explain briefly VLIW architecture.
- c) Which are the special addressing modes of p-DSPs with suitable example?
- d) Explain multiplier and multiplier accumulator of DSP.
- e) Explain in detail D/A conversion errors in DSP Systems.

#### Q.3 Attempt any two:

- a) Draw & explain Architecture of TMS320C5X Processor.
- b) Draw & Explain Block Diagram of DSP Starter Kit.
- c) Describe briefly Pipeline structure and operation TMS320C5X Processor.

#### SECTION – II

#### Q.4 Attempt any four:

- a) Explain in detail Data Addressing Modes of TMS320C54XX DSP.
- **b)** Explain the steps required for running a C54X assembly language in code composer studio.
- c) Write short note on C54X.
- d) Compare the feature of TMS320C6X and DSP563XX Processor.
- e) Describe briefly Interrupts of TMS320C54XX Processor.

#### Q.5 Attempt any two.

- a) Write the Program for convolutional codes using C54X program.
- **b)** Explain Pipeline operation in C54X.
- c) Draw & explain Architecture of Motorola DSP563XX.



Max. Marks: 56

16

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16

Seat	
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#### B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION**

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3. Each question carries one mark.

2) Assume suitable data if necessary

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

		3) Answer MCQ/Objective type Mention, Q.P. Set (P/Q/R/S)	questic on Top	ons on page No.3 only. Don't forge of page.	et to
		MCQ/Objective	Туре	Questions	
Dura	ition: 3	30 Minutes		Mark	s: 14
Q.1	Cho sent	ose the correct alternatives from tence.	the op	tions and rewrite the	14
	1)	<ul> <li>VLIW architecture differs from corfollowing aspects</li> <li>a) Instruction cache</li> <li>b) Number of Functional Units</li> <li>c) Using Pipelining</li> <li>d) A single word fetched from metabolic</li> </ul>	ventior emory h	al P-DSP in which of the as a number of instructions	
	2)	Number of memory accesses /clo chip DRAM of a P-DSP is a) 1 c) 4	ck/peric b) d)	od that can be achieved using on 2 3	
	3)	The features in which PDSP is su is a) Real time I/O capability c) Low Power	perior to b) d)	o advanced microprocessors Low cost Computational Speed	
	4)	The Memory mapped direct addre page. a) 0 c) 511	essing n b) d)	node is used to access data in 1 512	
	5)	The register which holds the addr is a) ARP c) ARB	ess of t b) d)	he current data memory page DP None	

- 6) The size of the C6X CPU is \_\_\_\_\_
  - a) 16-bit b) 32-bit
  - c) 40-bit 64-bit d)
- The floating point devices in C6X processors are \_\_\_\_\_ 7)
  - a) C67X C62X b)
  - c) C64X d) C64X & C62X

b)

d)

Davinci

- The C6X processor based on \_\_\_\_\_ architecture. 8) Advanced Harvard
  - a) Modified Harvard
  - c) Veloci TI

Max. Marks: 70

Set

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9)	C54X assembler directive res and when a label is used with this di address of the first word of the block a) .bes c) .word	serves rectiv c rese b) d)	and initializes n bits of memory e, the label is assigned the rved. .space .data	
10)	The external SRAM capacity in C54 wait states. a) 64K,1 c) 256K,1	02 kit b) d)	is words and requires 64K,7 256K,7	
11)	The Addressing that permits the con I/O to be accessed as memory locat a) Memory Mapped c) Circular Mode	itent i ion is b) d)	n internal register of the CPU &  Indirect addressing Bit Reversed Addressing	
12)	The addressing mode that is conver a) Indirect addressing c) Memory Mapped	nient f b) d)	or FFT computation is Circular Mode Bit Reversed Addressing	
13)	The number of instruction cycles rec microprocessor with no pipelining is a) 4 c) 3	duired b) d)	for executing a program in a  2 1	
14)	A P-DSP has four pipeline stages ar clock cycles required for executing a a) 29	nd use a prog b)	es four phase clock. The number of ram with 25 instruction is 28	of

c) 25 d) 26

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Seat No.

## B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION

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

Instructions: 1) All questions are compulsory.

2) Assume the suitable data if necessary.

## SECTION - I

## Q.2 Attempt any four:

- a) Explain in detail signals and coefficients in DSP Systems.
- b) Draw and explain briefly VLIW architecture.
- c) Which are the special addressing modes of p-DSPs with suitable example?
- d) Explain multiplier and multiplier accumulator of DSP.
- e) Explain in detail D/A conversion errors in DSP Systems.

## Q.3 Attempt any two:

- a) Draw & explain Architecture of TMS320C5X Processor.
- **b)** Draw & Explain Block Diagram of DSP Starter Kit.
- c) Describe briefly Pipeline structure and operation TMS320C5X Processor.

## SECTION – II

### Q.4 Attempt any four:

- a) Explain in detail Data Addressing Modes of TMS320C54XX DSP.
- **b)** Explain the steps required for running a C54X assembly language in code composer studio.
- c) Write short note on C54X.
- d) Compare the feature of TMS320C6X and DSP563XX Processor.
- e) Describe briefly Interrupts of TMS320C54XX Processor.

### Q.5 Attempt any two.

- a) Write the Program for convolutional codes using C54X program.
- **b)** Explain Pipeline operation in C54X.
- c) Draw & explain Architecture of Motorola DSP563XX.

Max. Marks: 56

16

12

16

NO.								
		E	B.E. (Part Electronio DSP	-II) (CGPA) cs & Telecc PROCESS	Exam ommu ORS &	ninat nica & AF	ion Nov/Dec-2019 ition Engineering PPLICATION	
Day & Time	& Date : 02:30	e: Tue 0 PM	sday, 26-11 To 05:30 PI	-2019 ⁄I			Ν	/lax. Marks: 70
Instr	uctior	ns: 1) 2) 3)	Q.No.1 is c Book Page Assume su Answer MC Mention, Q	ompulsory an No.3. Each q itable data if r Q/Objective t .P. Set (P/Q/R	d shoul uestion necessa type qua R/S) on	ld be carr ary. estio Top	solved in first 30 Minute ies one mark. ns on page No.3 only. E of page.	es in answer Don't forget to
			М	CQ/Objecti	ve Ty	pe C	Questions	
Durat	tion: 3	0 Min	utes					Marks: 14
Q.1	Choo	ose th ence	e correct a	Iternatives fr	om the	e opt	ions and rewrite the	14
	10)	The a) c)	size of the C 16-bit 40-bit	C6X CPU is	•	b) d)	32-bit 64-bit	
	2)	The f a) ( c) (	floating poin C67X C64X	t devices in C	6X pro	cess b) d)	ors are C62X C64X & C62X	
	3)	The a) I c) \	C6X proces Modified Ha √eloci TI	sor based on rvard		archi b) d)	tecture. Advanced Harvard Davinci	
	4)	and v addre a) . c) .	_ C54X ass when a labe ess of the fin bes word	embler direct I is used with rst word of the	ive rese this dire block	erves ective resei b) d)	and initializes n bits of e, the label is assigned ved. .space .data	memory the
	5)	The ( a) ( c) 2	external SR wait state 64K,1 256K,1	AM capacity i s.	n C540	2 kit b) d)	is words and rec 64K,7 256K,7	luires
	6)	The I/O to a) I c) (	Addressing b be access Memory Ma Circular Moo	that permits th ed as memory pped de	ne cont y locatio	ent ir on is b) d)	n internal register of the  Indirect addressing Bit Reversed Addressi	CPU &
	7)	The a a) I c) I	addressing ndirect add Memory Ma	mode that is c ressing pped	conveni	ent fo b) d)	or FFT computation is _ Circular Mode Bit Reversed Addressi	 ng

- 8) The number of instruction cycles required for executing a program in a microprocessor with no pipelining is \_
  - a) 4 b) 2 d) 1
  - c) 3

Page **10** of **12** 

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			SLR-FM-27	'8
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9)	A P-DSP has four pipeline stages an clock cycles required for executing a a) 29 c) 25	d use prog b) d)	es four phase clock. The number of ram with 25 instruction is 28 26	
10)	<ul> <li>VLIW architecture differs from conversion following aspects</li> <li>a) Instruction cache</li> <li>b) Number of Functional Units</li> <li>c) Using Pipelining</li> <li>d) A single word fetched from memory</li> </ul>	ntion: ory ha	al P-DSP in which of the	
11)	Number of memory accesses /clock/ chip DRAM of a P-DSP is a) 1 c) 4	perio b) d)	d that can be achieved using on 2 3	
12)	The features in which PDSP is super is a) Real time I/O capability c) Low Power	ior to b) d)	advanced microprocessors Low cost Computational Speed	
13)	The Memory mapped direct addressi page. a) 0 c) 511	ng m b) d)	ode is used to access data in 1 512	
14)	The register which holds the address is	of th	e current data memory page	

- a) ARP c) ARB DP b) d) None

Seat No.

## B.E. (Part -II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DSP PROCESSORS & APPLICATION

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

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data if necessary.

## SECTION - I

## Q.2 Attempt any four:

- a) Explain in detail signals and coefficients in DSP Systems.
- **b)** Draw and explain briefly VLIW architecture.
- c) Which are the special addressing modes of p-DSPs with suitable example?
- d) Explain multiplier and multiplier accumulator of DSP.
- e) Explain in detail D/A conversion errors in DSP Systems.

## Q.3 Attempt any two:

- a) Draw & explain Architecture of TMS320C5X Processor.
- b) Draw & Explain Block Diagram of DSP Starter Kit.
- c) Describe briefly Pipeline structure and operation TMS320C5X Processor.

## SECTION – II

## Q.4 Attempt any four:

- a) Explain in detail Data Addressing Modes of TMS320C54XX DSP.
- **b)** Explain the steps required for running a C54X assembly language in code composer studio.
- c) Write short note on C54X.
- d) Compare the feature of TMS320C6X and DSP563XX Processor.
- e) Describe briefly Interrupts of TMS320C54XX Processor.

## Q.5 Attempt any two.

- a) Write the Program for convolutional codes using C54X program.
- **b)** Explain Pipeline operation in C54X.
- c) Draw & explain Architecture of Motorola DSP563XX.



Max. Marks: 56

16

12

16

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering INTERNET OF THINGS**

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) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- As per IoT conceptual framework, Gather + Enrich + Stream + Manage + 1) Acquire + Organise & Analyse =
  - a) Things framework
  - c) Internet of Things d) Internet

#### As per IoT architectural view suggested by CISCO level-3 deals with, 2)

b)

- a) Data abstraction b)
- c) Edge computing d)
- Why is IPv6 preferred over IPv4 for IoT implementations? 3) More security
  - a) Larger addressing range b)
  - c) Both a and b d) Neither a or b
- 4) The paging operation of a Bluetooth device is used for \_
  - Forming a connection between two Bluetooth devices a)
    - b) Trying to discover other devices near it
    - c) Entering a low-power sleep mode
    - d) All of these
- Which of these can be considered as the sensory organs for IoT? 5)
  - Transportation a) Buildings b)
  - d) c) Banks Sensors
- 6) The address space in ARM is \_\_\_\_\_
  - 2^64 a) 2^24 b)
  - c) 2^16 d) 2^32
- A programmable timer device used to ensure that processor is running is . 7)
  - a) Real Time Clock Phase Lock Loop b) Simulation Time Clock c) Watchdog Timer d)
- LPC1768's maximum operating frequency is 8)
  - a) 100MHz b) 110MHz
  - c) 12MHz 60MHz d)
- 9) Which of these statements is NOT TRUE?
  - a) MQTT is a publish-subscribe protocol
  - b) MQTT is a client-server protocol
  - MQTT is a lightweight messaging protocol C)
  - MQTT is used in conjunction with TCP/IP d)

Max. Marks: 70

Marks: 14

Set

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- Data accumulation
- Connectivity

Network of Things

Seat

No.

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- MQTT is designed for \_\_\_\_\_. 10)
  - a) Remote connections
  - c) Small-code footprint
- 11) Which layer is CoAP?
  - a) Control layer
  - c) Service layer
- Wifi enabled device can be \_\_\_\_\_. 12)
  - a) PC
  - c) Mobile phone
- CoAP is a specialized \_\_\_\_\_ protocol. 13)
  - a) Web Transfer
  - c) Application d)
- Application layer d)

Transport layer

All of these

Limited bandwidth

b)

d)

b)

b)

- Game Console
- d) All of the above

Resource

- b) Power
- What is A2DP? 14)
  - a) Bluetooth profile for streaming audio
  - b) Bluetooth profile for security
  - c) Bluetooth profile for streaming video
  - d) None of These

Seat	
No.	

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INTERNET OF THINGS

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

## **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

## Section – I

## Q.2 Attempt any four.

- a) List the components available in Intel based intelligent gateway for a smart home.
- **b)** Show the comparison between OSI layer and ITU-T reference model layers.
- c) Explain UART and I2C bus interfaces. When and where these interfaces are used?
- d) Write an ARM ASM code to find length of null terminated string.
- e) Discuss the operation modes and privilege levels supported in Cortex-M3 processor with neat diagram.

## Q.3 Attempt any two.

- a) Discuss how 15 branch conditions are defined with the combinations of the four flags (N, Z, C, and V).
- **b)** Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
- c) Draw and explain ARM Cortex-M3 processor architecture in detail with a neat diagram.

## Section – II

## Q.4 Attempt any four.

- a) List down principal components and topologies in a Zigbee network.
- **b)** Discuss with neat diagram the IEEE 802.11 protocol stack.
- c) Write short note on Message Oriented Middleware (MOM) protocols.
- d) Discuss what is meant by RESTful protocol with an example.
- e) What is MQTT protocol? List down the requirements provided by MQTT protocol.

## Q.5 Attempt any two.

- a) Discuss the architecture of CoAP system.
- **b)** With neat diagram illustrate the differences in management of cloud models.

## c) Write a short note on:

- 1) RFID tags
- 2) RFID Interrogators
- 3) RFID Controllers
- 4) RFID frequency bands

Max. Marks: 56

12

16

12

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering INTERNET OF THINGS**

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) Figures to the right indicate full marks.
  - Assume suitable data if necessary.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

4)

Seat

No.

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

- LPC1768's maximum operating frequency is \_ 1)
  - a) 100MHz 110MHz b)
  - c) 12MHz d) 60MHz
- 2) Which of these statements is NOT TRUE?
  - a) MQTT is a publish-subscribe protocol
  - b) MQTT is a client-server protocol
  - c) MQTT is a lightweight messaging protocol
  - d) MQTT is used in conjunction with TCP/IP
- 3) MQTT is designed for \_\_\_\_\_

Which layer is CoAP?

- a) Remote connections
- c) Small-code footprint
- a) Control layer Transport layer b)
- c) Service layer
- Wifi enabled device can be \_\_\_\_ 5) a) PC b)
  - Game Console All of the above c) Mobile phone d)
- 6) CoAP is a specialized \_\_\_\_\_ protocol.
  - a) Web Transfer b) Power
  - c) Application d) Resource
- What is A2DP? 7)
  - a) Bluetooth profile for streaming audio
  - b) Bluetooth profile for security
  - c) Bluetooth profile for streaming video
  - d) None of These
- As per IoT conceptual framework, Gather + Enrich + Stream + Manage + 8) Acquire + Organise & Analyse =
  - a) Things framework b) Network of Things
  - c) Internet of Things d) Internet

b) Limited bandwidth

- d) All of these
- **Application layer** d)



S	LF	<b>}-</b>	F	M	-2	2	7	9

Max. Marks: 70

Page 5 of 12

- 9) As per IoT architectural view suggested by CISCO level-3 deals with, \_\_\_\_\_.
  - a) Data abstraction
- Data accumulation b)

**SLR-FM-279** 

Set Q

- c) Edge computing
- d) Connectivity
- Why is IPv6 preferred over IPv4 for IoT implementations? 10)
  - a) Larger addressing range b) c) Both a and b
    - More security d) Neither a or b
- The paging operation of a Bluetooth device is used for \_\_\_\_\_. 11)
  - a) Forming a connection between two Bluetooth devices
  - b) Trying to discover other devices near it
  - c) Entering a low-power sleep mode
  - d) All of these
- Which of these can be considered as the sensory organs for IoT? 12)
  - Transportation a) Buildings b) Sensors
  - c) Banks d)
- The address space in ARM is \_\_\_\_ 13)
  - b) a) 2^24
  - c) 2^16 2^32 d)
- A programmable timer device used to ensure that processor is running is \_\_\_\_\_. 14)
  - Real Time Clock a)
  - c) Watchdog Timer
- Phase Lock Loop b)

2^64

Simulation Time Clock d)

## Set

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INTERNET OF THINGS

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

## **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

## Section – I

## Q.2 Attempt any four.

Seat No.

- a) List the components available in Intel based intelligent gateway for a smart home.
- **b)** Show the comparison between OSI layer and ITU-T reference model layers.
- c) Explain UART and I2C bus interfaces. When and where these interfaces are used?
- d) Write an ARM ASM code to find length of null terminated string.
- e) Discuss the operation modes and privilege levels supported in Cortex-M3 processor with neat diagram.

## Q.3 Attempt any two.

- a) Discuss how 15 branch conditions are defined with the combinations of the four flags (N, Z, C, and V).
- **b)** Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
- c) Draw and explain ARM Cortex-M3 processor architecture in detail with a neat diagram.

### Section – II

## Q.4 Attempt any four.

- a) List down principal components and topologies in a Zigbee network.
- **b)** Discuss with neat diagram the IEEE 802.11 protocol stack.
- c) Write short note on Message Oriented Middleware (MOM) protocols.
- d) Discuss what is meant by RESTful protocol with an example.
- e) What is MQTT protocol? List down the requirements provided by MQTT protocol.

## Q.5 Attempt any two.

- a) Discuss the architecture of CoAP system.
- **b)** With neat diagram illustrate the differences in management of cloud models.

## c) Write a short note on:

- 1) RFID tags
- 2) RFID Interrogators
- 3) RFID Controllers
- 4) RFID frequency bands

Max. Marks: 56

12

16

12

**INTERNET OF THINGS** 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) Figures to the right indicate full marks. 3) Assume suitable data if necessary. MCQ/Objective Type Questions Q.1 Choose the correct alternatives from the options and rewrite the sentence. Which of these can be considered as the sensory organs for IoT? a) Buildings b) Transportation c) Banks d) Sensors The address space in ARM is \_\_\_\_\_. b) 2^64 a) 2^24 c) 2^16 d) 2^32

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

**Duration: 30 Minutes** 

1)

2)

Seat

No.

A programmable timer device used to ensure that processor is running is \_\_\_\_\_. 3)

Phase Lock Loop a) Real Time Clock b) Simulation Time Clock c) Watchdog Timer d)

#### LPC1768's maximum operating frequency is \_\_\_\_\_ 4)

- a) 100MHz b) 110MHz
- c) 12MHz d) 60MHz
- 5) Which of these statements is NOT TRUE?
  - MQTT is a publish-subscribe protocol a)
    - b) MQTT is a client-server protocol
    - c) MQTT is a lightweight messaging protocol
    - d) MQTT is used in conjunction with TCP/IP

#### 6) MQTT is designed for

- a) Remote connections c) Small-code footprint
- Which layer is CoAP?
- 7) a) Control layer
  - Transport layer b) c) Service layer **Application layer** d)
- 8) Wifi enabled device can be \_\_\_\_\_.
  - a) PC b) Game Console
  - c) Mobile phone All of the above d)
- CoAP is a specialized \_\_\_\_\_ protocol. 9)
  - a) Web Transfer Power b) c) Application Resource d)

b) Limited bandwidth

- All of these d)



# SLR-FM-279

Marks: 14

14

Set

Max. Marks: 70

10) What is A2DP?

- a) Bluetooth profile for streaming audio
- b) Bluetooth profile for security
- c) Bluetooth profile for streaming video
- d) None of These
- 11) As per IoT conceptual framework, Gather + Enrich + Stream + Manage + Acquire + Organise & Analyse =\_\_\_\_
  - a) Things framework b) Network of Things
  - c) Internet of Things d) Internet
- 12) As per IoT architectural view suggested by CISCO level-3 deals with, \_\_\_\_\_.
  - a) Data abstraction b) Data accumulation
  - c) Edge computing d) Connectivity
- 13) Why is IPv6 preferred over IPv4 for IoT implementations?
  - a) Larger addressing range b) More security
  - c) Both a and b d) Neither a or b
- 14) The paging operation of a Bluetooth device is used for \_\_\_\_\_
  - a) Forming a connection between two Bluetooth devices
  - b) Trying to discover other devices near it
  - c) Entering a low-power sleep mode
  - d) All of these

**SLR-FM-279** 

Set R

## S

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INTERNET OF THINGS

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

## **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

## Section – I

## Q.2 Attempt any four.

Seat No.

- a) List the components available in Intel based intelligent gateway for a smart home.
- **b)** Show the comparison between OSI layer and ITU-T reference model layers.
- c) Explain UART and I2C bus interfaces. When and where these interfaces are used?
- d) Write an ARM ASM code to find length of null terminated string.
- e) Discuss the operation modes and privilege levels supported in Cortex-M3 processor with neat diagram.

## Q.3 Attempt any two.

- a) Discuss how 15 branch conditions are defined with the combinations of the four flags (N, Z, C, and V).
- **b)** Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
- c) Draw and explain ARM Cortex-M3 processor architecture in detail with a neat diagram.

### Section – II

## Q.4 Attempt any four.

- a) List down principal components and topologies in a Zigbee network.
- **b)** Discuss with neat diagram the IEEE 802.11 protocol stack.
- c) Write short note on Message Oriented Middleware (MOM) protocols.
- d) Discuss what is meant by RESTful protocol with an example.
- e) What is MQTT protocol? List down the requirements provided by MQTT protocol.

## Q.5 Attempt any two.

- a) Discuss the architecture of CoAP system.
- **b)** With neat diagram illustrate the differences in management of cloud models.

## c) Write a short note on:

- 1) RFID tags
- 2) RFID Interrogators
- 3) RFID Controllers
- 4) RFID frequency bands

Max. Marks: 56

12

16

12

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering INTERNET OF THINGS**

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) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- MQTT is designed for \_ 1)
  - a) Remote connections
  - Small-code footprint C)
- 2) Which layer is CoAP?
  - a) Control layer
    - c) Service layer d)
- Wifi enabled device can be \_ 3)
  - a) PC c) Mobile phone d) All of the above
- 4) CoAP is a specialized \_\_\_\_\_ protocol.
  - a) Web Transfer Power b) d) Resource
  - c) Application
- What is A2DP? 5)
  - a) Bluetooth profile for streaming audio
  - b) Bluetooth profile for security
  - c) Bluetooth profile for streaming video
  - d) None of These

#### 6) As per IoT conceptual framework, Gather + Enrich + Stream + Manage + Acquire + Organise & Analyse =

- a) Things framework b) Network of Things
- c) Internet of Things d) Internet
- 7) As per IoT architectural view suggested by CISCO level-3 deals with, \_\_\_\_\_. Data accumulation
  - a) Data abstraction b)
  - c) Edge computing d) Connectivity
- 8) Why is IPv6 preferred over IPv4 for IoT implementations?
  - a) Larger addressing range c) Both a and b
    - b) More security Neither a or b d)

- d) All of these
- b) Transport layer
- **Application layer**
- Game Console b)
- b) Limited bandwidth



Max. Marks: 70

Marks: 14

Set S 9) The paging operation of a Bluetooth device is used for \_ a) Forming a connection between two Bluetooth devices b) Trying to discover other devices near it c) Entering a low-power sleep mode d) All of these 10) Which of these can be considered as the sensory organs for IoT? a) Buildings Transportation b) c) Banks d) Sensors 11) The address space in ARM is \_\_\_\_\_. b) 2^64 a) 2^24 c) 2^16 d) 2^32 12) A programmable timer device used to ensure that processor is running is \_\_\_\_\_. a) Real Time Clock Phase Lock Loop b) c) Watchdog Timer d) Simulation Time Clock 13) LPC1768's maximum operating frequency is 110MHz a) 100MHz b) c) 12MHz d) 60MHz 14) Which of these statements is NOT TRUE? MQTT is a publish-subscribe protocol a)

- b) MQTT is a client-server protocol
- c) MQTT is a lightweight messaging protocol
- d) MQTT is used in conjunction with TCP/IP

**SLR-FM-279** 

## Set S

## B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INTERNET OF THINGS

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

## **Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

## Section – I

## Q.2 Attempt any four.

Seat No.

- a) List the components available in Intel based intelligent gateway for a smart home.
- **b)** Show the comparison between OSI layer and ITU-T reference model layers.
- c) Explain UART and I2C bus interfaces. When and where these interfaces are used?
- d) Write an ARM ASM code to find length of null terminated string.
- e) Discuss the operation modes and privilege levels supported in Cortex-M3 processor with neat diagram.

## Q.3 Attempt any two.

- a) Discuss how 15 branch conditions are defined with the combinations of the four flags (N, Z, C, and V).
- **b)** Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
- c) Draw and explain ARM Cortex-M3 processor architecture in detail with a neat diagram.

### Section – II

## Q.4 Attempt any four.

- a) List down principal components and topologies in a Zigbee network.
- **b)** Discuss with neat diagram the IEEE 802.11 protocol stack.
- c) Write short note on Message Oriented Middleware (MOM) protocols.
- d) Discuss what is meant by RESTful protocol with an example.
- e) What is MQTT protocol? List down the requirements provided by MQTT protocol.

## Q.5 Attempt any two.

- a) Discuss the architecture of CoAP system.
- **b)** With neat diagram illustrate the differences in management of cloud models.

## c) Write a short note on:

- 1) RFID tags
- 2) RFID Interrogators
- 3) RFID Controllers
- 4) RFID frequency bands

Max. Marks: 56

12

16

12

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III**

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) Figures to the right indicate full marks.
- 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

- The particular Integral of  $(D + 1)^3 y = e^{-x}$  is \_\_\_\_ b)  $\frac{x^2}{2}e^{-x}$ a)  $\frac{x^3}{3!}e^{-x}$ 
  - c)  $xe^x$ d) None of these
- The complete solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_. 2)
  - a)  $y = (c_1 + c_2 x)e^x + (c_3 + c_4 x)e^{-x}$ b)  $y = (c_1 + c_2)e^x + (c_3 + c_4 x)e^{-x}$

  - c)  $y = (c_1 + c_2 x) \cos \sqrt{3}x + (c_3 + c_4 x) \sin \sqrt{3}x$
  - d)  $y = (c_1 + c_2 x) \cos 3x + (c_3 + c_4 x) \sin 3x$

The solution of px + qy = z is \_\_\_\_\_. a)  $\phi(x + y, y + z) = 0$  b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$ 3) c)  $\phi\left(\frac{x^2}{y}, \frac{y^2}{z}\right) = 0$ d)  $\phi(xy,yz) = 0$ The value of the integral  $\int_{0}^{\infty} e^{-3t} \sin t dt$  is\_\_\_\_\_. 4) b)  $\frac{1}{5}$ d)  $\frac{1}{10}$ a) 5 c) 10 The Laplace transform of  $(\sin t + \cos t)^2$  is \_\_\_\_\_.  $2) \frac{1}{s} \frac{2}{t}$  b)  $\frac{1}{s} + \frac{2}{s^2+4}$ 5)

c)  $\frac{1}{s} - \frac{2}{s^2 - 4}$ d)  $\frac{1}{s} + \frac{2}{s^2 - 4}$  $\frac{1}{(s+3)^2}$  is the Laplace transform of \_\_\_\_ 6) b)  $t^2 e^{-3t}$ a)  $t e^{-3t}$ c)  $e^{-3t}$ d)  $t e^{3t}$ 7)  $L^{-1}\left\{\frac{1}{s^2-6s+25}\right\} =$ \_\_\_\_\_. a)  $\frac{e^{-3t}}{4}\sin 4t$ 

c)  $e^{-3t} \sin 4t$ 

b) 
$$\frac{e^{-3t}\cos 4t}{4}$$
  
d)  $\frac{e^{3t}\sin 4t}{4}$ 

Set

Max. Marks: 70

SLR-FM-675

Marks: 14

				Set	Ρ
8)	The directional derivative of $\phi = xy$ the direction of a) $i + j + k$ c) $2i + 2j + 2k$	+ yz b) d)	z + zx at (1,1,1) is maximum i i - j + k 2i - 2j + 2k	n	
9)	If $\bar{r} = xi + yj + zk$ and $\bar{a}$ is a consta a) $\bar{a}$ c) $\bar{a}.\bar{r}$	nt ve b) d)	ector then $\nabla(\bar{a}.\bar{r}) = $ $\bar{r}$		
10)	If $z\{a^k\} = \frac{z}{z-a}$ then $z\{k, a^k\} =$ a) $\frac{a}{(z-a)^2}$ c) $\frac{z}{(z-a)^2}$	b) d)	$\frac{az}{(z-a)^2}$ $\frac{-1}{(z-a)^2}$		
11)	The inverse z-transform of $\frac{z}{z-1}$ , $ z  > a$ a) -1 c) 0	• 1 is b) d)	6		
12)	If $f(x) = x$ is represented by Fourie constant term. a) $\frac{\pi}{2}$ c) 0	r sei b) d)	ries in $(-\pi, \pi)$ then is $\pi$ $2\pi$	s the	
13)	For Fourier series expansion, functional Harmonic c) Cauchy	on n b) d)	nust be Reimann Periodic		
14)	The Fourier sine transform of $f(x) =$ a) $\sqrt{\frac{2}{\pi}}$ c) $\sqrt{\frac{2}{\pi}} (1-\sin s)$	= {1 0 b) d)	$\int_{x}^{0} \leq x < 1 \text{ is } \underline{\qquad}$ $\int_{\pi}^{\frac{2}{\pi}} (1 - \cos s) \int_{x}^{\frac{2}{\pi}} (1 - \cos s)$		
	$\sqrt{\pi}$ (s)		$\sqrt{\pi}$ s J		

		SLR-F	<b>M-</b> 6	675
Seat No.	t	S	Set	Ρ
		S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III	-	
Day a Time	& Da : 10	ate: Saturday, 07-12-2019 Max. Max. Max. Max. Max. Max. Max. Max.	Mark	s: 56
Instr	ucti	<ul> <li>ons: 1) Q. No. 5 &amp; Q. 6 are compulsory.</li> <li>2) Solve any two questions from each section.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Use of calculator is allowed.</li> </ul>		
		Section – I		
Q.2	So	Ive any three of the following questions.		09
	a) b)	Solve $(D^2 + 4)y = \sin^2 x$ Solve $(D^2 + 2D + 2)y = x^2 + 2x + 1$		
	c)	Solve $(D^2 + 3D + 2)y = x^2 + 3x + 1$ Solve $(D^2 + 2D + 5)y = e^{-x} \sin 2x$		
	-	OR		
	_	Solve $(D^3 + 1)y = 65\cos(2x + 1)$		
Q.3	So	Ive the following questions. $r(n^2 - n^2) = n$		09
	a) b) c)	$2(p^{2} - q^{2}) = x - y$ $p^{3} + q^{3} = 27z$ $px^{2} + qy^{2} = (x + y)z$		
Q.4	So	Ive the following questions.		09
	a)	Find $L\{e^{-t}\cos^2 3t\}$		
	b)	Find $L\left\{\frac{\cos 6t - \cos 4t}{t}\right\}$		
	C)	Find the laplace transform of the periodic function defined by $kt$		
		$f(t) = \frac{\pi}{T}, 0 < t < T$		
		where $f(t+T) = f(t)$		
Q.5	So	Ive the following questions. $(2s^2 + 5s - 4)$		02
	aj	Find $L^{-1}\left\{\frac{23+33-4}{s^3+s^2-2s}\right\}$		03
	b)	Using the convolution theorem, find the inverse Laplace transform of $1$		03
		$(s-1)(s^2+1)$		
	c)	Solve $y'' + 2y' + y = 3t e^{-t}$ , given that $y = 4$ , $y' = 2$ when $t = 0$ using Laplace transform.		04
		Section – II		
Q.6	a)	Find the unit tangent vector at any point on the curve given by $r = t^2 + 2$ $y = 4t - 5$ and $z = 2t^2 - 6t$ where t is any variable. Also		04
		determine unit tangent vector at $t = 2$ .		
	b)	Find the value of constant a, b and c for which vector $\bar{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$ is irrotational		03

c) Find the angle between the normals to the surface  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at (-1,2,1) 03

			SLR-FM-6	675
			Set	Ρ
Q.7	a)	Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) OR		05
	b)	Find the Fourier series of $f(x) = x^2 - 2$ , $-2 \le x \le 2$ Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$		05 04
Q.8	a)	Express $f(x) = \begin{cases} \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$ as a Fourier integral and show that $\int_{0}^{\infty} \frac{\sin wx. \sin \pi w}{1 - w^{2}} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$		03
	b)	Find Fourier sine transform of $f(x) = \begin{cases} \sin x, & 0 < x < 1 \\ 0, & x > 1 \end{cases}$		03
	c)	Find the Fourier transform of $f(x) = \begin{cases} \sqrt{2\pi}, &  x  < a \\ 0, &  x  > a \end{cases}$		03
Q.9	Sol a)	Ive any three of the following questions. Find the inverse z-transform of $\frac{1}{z^2-3z+2}$ , $ z  > 2$		09
	b)	Find the inverse z-transform of $\frac{z^2}{\left(z-\frac{1}{4}\right)\left(z-\frac{1}{5}\right)}$ , $ z  < \frac{1}{5}$		

**c)** Find 
$$z\left\{3^k \sin\left(\frac{k\pi}{2}\right)\right\}, k \ge 0$$

**d)** Find 
$$z \left\{ 4^k + \frac{1}{4^k} \right\}, k \ge 0$$

Page **4** of **16** 

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III**

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) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

## **Duration: 30 Minutes**

a)

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

1)	The directional derivative of $\phi = x$	xy + yz + zx at (1,1,1) is maximum in
	the direction of	
	a) $i+j+k$	b) $i-j+k$

- c) 2i + 2j + 2kd) 2i - 2j + 2k2) If  $\bar{r} = xi + yj + zk$  and  $\bar{a}$  is a constant vector then  $\nabla(\bar{a}.\bar{r}) =$  \_\_\_\_\_.
- b)  $\bar{r}$ a) ā c)  $\bar{a}.\bar{r}$ d) 0

3)	If $z\{a^k\} = \frac{z}{z-a}$ then $z\{k, a\}$	$a^k\} = \_\_\$	
	a) $\frac{a}{(z-a)^2}$	b)	$\frac{az}{(z-a)^2}$
	C) $\frac{z}{(z-a)^2}$	d)	$\frac{-1}{(z-a)^2}$

The inverse z-transform of  $\frac{z}{z-1}$ , |z| > 1 is \_\_\_\_\_. a) -1 b) 1 4)

C)	0	d)	Κ	

If f(x) = x is represented by Fourier series in  $(-\pi, \pi)$  then \_\_\_\_\_ is the 5) constant term.

b) π

 $\frac{\pi}{2}$ c) 0 d) 2π

For Fourier series expansion, function must be \_\_\_\_\_ 6) a) Harmonic b) Reimann c) Cauchy d) Periodic The Fourier sine transform of  $f(x) = \begin{cases} 1, & 0 \le x < 1 \\ 0, & x > 1 \end{cases}$  is \_\_\_\_\_. a)  $\sqrt{\frac{2}{\pi}}$  b)  $\sqrt{\frac{2}{\pi}} (1 - \cos s)$ 7)

d)  $\sqrt{\frac{2}{\pi}} \left( \frac{1 - \cos s}{s} \right)$ C)  $\sqrt{\frac{2}{\pi}} \left( \frac{1-\sin s}{s} \right)$ 

Max. Marks: 70

Marks: 14

**SLR-FM-675** 

Set

## Seat No.

## The particular Integral of $(D + 1)^3 y = e^{-x}$ is \_\_\_\_\_. a) $\frac{x^3}{3!}e^{-x}$ b) $\frac{x^2}{2}e^{-x}$ . 8) a) $\frac{x^3}{3!}e^{-x}$ c) $xe^x$ d) None of these The complete solution of $(D^4 + 6D^2 + 9)y = 0$ is \_\_\_\_\_. 9) a) $y = (c_1 + c_2 x)e^x + (c_3 + c_4 x)e^{-x}$ b) $y = (c_1 + c_2)e^x + (c_3 + c_4 x)e^{-x}$ c) $y = (c_1 + c_2 x) \cos \sqrt{3}x + (c_3 + c_4 x) \sin \sqrt{3}x$ d) $y = (c_1 + c_2 x) \cos 3x + (c_3 + c_4 x) \sin 3x$ The solution of px + qy = z is \_\_\_\_\_. a) $\phi(x + y, y + z) = 0$ b) $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$ 10) $c) \quad \phi\left(\frac{x^2}{y}, \frac{y^2}{z}\right) = 0$ d) $\phi(xy,yz) = 0$ The value of the integral $\int_{0}^{\infty} e^{-3t} \sin t dt$ is\_\_\_\_\_. a) 5 b) $\frac{1}{5}$ c) 10 d) $\frac{1}{10}$ 11) The Laplace transform of $(\sin t + \cos t)^2$ is \_\_\_\_\_. a) $\frac{1}{2} - \frac{2}{2+4}$ b) $\frac{1}{s} + \frac{2}{s^2+4}$ 12) a) $\frac{1}{s} - \frac{2}{s^2 + 4}$ c) $\frac{1}{s} - \frac{2}{s^2 - 4}$ d) $\frac{1}{(s+3)^2}$ is the Laplace transform of \_\_\_\_\_ d) $\frac{1}{s} + \frac{2}{s^2 - 4}$ 13) b) $t^2 e^{-3t}$ a) $t e^{-3t}$ c) $e^{-3t}$ d) $t e^{3t}$ 14) $L^{-1}\left\{\frac{1}{s^2-6s+25}\right\} =$ \_\_\_\_\_. a) $\frac{e^{-3t}}{4}\sin 4t$ b) $\frac{e^{-3t}\cos 4t}{4}$ d) $\frac{e^{3t}\sin 4t}{4}$ c) $e^{-3t} \sin 4t$

**SLR-FM-675** 

Set

		SL	R-FM-6	675
Seat No.	t		Set	Q
		S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-20 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III	19	
Day a Time	& Da : 10:	ate: Saturday, 07-12-2019 :00 AM To 01:00 PM	Max. Mark	s: 56
Instr	ucti	<ul> <li>ons: 1) Q. No. 5 &amp; Q. 6 are compulsory.</li> <li>2) Solve any two questions from each section.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Use of calculator is allowed.</li> </ul>		
		Section – I		
Q.2	So	Ive any three of the following questions.		09
	a) b) c)	Solve $(D^2 + 4)y = \sin^2 x$ Solve $(D^2 + 3D + 2)y = x^2 + 3x + 1$ Solve $(D^2 + 2D + 5)y = e^{-x} \sin 2x$		
	0)	OR		
		Solve $(D^3 + 1)y = 65\cos(2x + 1)$		
Q.3	So	Ive the following questions.		09
	a) b) c)	z(p2 - q2) = x - y p3 + q3 = 27z px2 + qy2 = (x + y)z		
Q.4	So a)	Ive the following questions. Find $L\{e^{-t}\cos^2 3t\}$		09
	b)	Find $L\left\{\frac{\cos 6t - \cos 4t}{t}\right\}$		
	C)	Find the laplace transform of the periodic function defined by $f(t) = \frac{kt}{k}, 0 < t < T$		
		where $f(t+T) = f(t)$		
Q.5	So	Ive the following questions.		
	a)	Find $L^{-1}\left\{\frac{2s^2+5s-4}{2}\right\}$		03
	b)	Using the convolution theorem, find the inverse Laplace transform $1$	of	03
		$\overline{(s-1)(s^2+1)}$		
	c)	Solve $y'' + 2y' + y = 3t e^{-t}$ , given that $y = 4$ , $y' = 2$ when $t = 0$ us Laplace transform.	sing	04
		Section – II		
Q.6	a)	Find the unit tangent vector at any point on the curve given by $x = t^2 + 2$ , $y = 4t - 5$ and $z = 2t^2 - 6t$ where t is any variable. Als	0	04
	b)	determine unit tangent vector at $t = 2$ . Find the value of constant a, b and c for which vector $\overline{u} = (u + u + av)i + (hu + 2u - v)i + (2u + av + v)h$ is irretational		03
		v = (x + y + uz)i + (vx + 3y - z)j + (3x + cy + z)k is inotational		

c) Find the angle between the normals to the surface  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at (-1,2,1) 03

			SLR-FM-675	
			Set	Q
Q.7	a)	Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) OR		05
	b)	Find the Fourier series of $f(x) = x^2 - 2$ , $-2 \le x \le 2$ Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$		05 04
Q.8	a)	Express $f(x) = \begin{cases} \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$ as a Fourier integral and show that $\int_{0}^{\infty} \frac{\sin wx. \sin \pi w}{1 - w^{2}} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$		03
	b)	Find Fourier sine transform of $f(x) = \begin{cases} \sin x, & 0 < x < 1 \\ 0, & x > 1 \end{cases}$		03
	c)	Find the Fourier transform of $f(x) = \begin{cases} \sqrt{2\pi}, &  x  < a \\ 0, &  x  > a \end{cases}$		03
Q.9	Sol a)	Ive any three of the following questions. Find the inverse z-transform of $\frac{1}{z^2-3z+2}$ , $ z  > 2$		09
	b)	Find the inverse z-transform of $\frac{z^2}{\left(z-\frac{1}{4}\right)\left(z-\frac{1}{5}\right)}$ , $ z  < \frac{1}{5}$		

**c)** Find 
$$z\left\{3^k \sin\left(\frac{k\pi}{2}\right)\right\}, k \ge 0$$

**d)** Find 
$$z \left\{ 4^k + \frac{1}{4^k} \right\}, k \ge 0$$

Page **8** of **16** 

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III**

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) Figures to the right indicate full marks.
- 3) 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. Q.1 14

The Laplace transform of  $(\sin t + \cos t)^2$  is \_\_\_\_\_ a)  $\frac{1}{2} - \frac{2}{3}$  b)  $\frac{1}{s} + \frac{2}{s^2+4}$ 1) a)  $\frac{1}{s} - \frac{2}{s^2 + 4}$ c)  $\frac{1}{s} - \frac{2}{s^2 - 4}$ d)  $\frac{1}{s} + \frac{2}{s^2 - 4}$  $\frac{1}{(s+3)^2}$  is the Laplace transform of \_\_\_\_\_. 2) b)  $t^2 e^{-3t}$ a)  $t e^{-3t}$ c)  $e^{-3t}$ d)  $t e^{3t}$  $L^{-1}\left\{\frac{1}{s^2 - 6s + 25}\right\} = \underline{\qquad}.$ 3) a)  $\frac{e^{-3t}}{4}\sin 4t$ b)  $\frac{e^{-3t}\cos 4t}{4}$ d)  $e^{3t} \sin 4t$ c)  $e^{-3t} \sin 4t$ The directional derivative of  $\phi = xy + yz + zx$  at (1,1,1) is maximum in 4) the direction of \_\_\_\_\_. a) i+j+kb) i - j + kd) 2i - 2i + 2kc) 2i + 2j + 2k

If  $\bar{r} = xi + yj + zk$  and  $\bar{a}$  is a constant vector then  $\nabla(\bar{a}.\bar{r}) = ...$ 5) a) ā b)  $\bar{r}$ d) 0 c)  $\bar{a}.\bar{r}$ If  $z\{a^k\} = \frac{z}{z-a}$  then  $z\{k, a^k\} =$ \_\_\_\_\_. 6) b)  $\frac{az}{(z-a)^2}$ a)  $\frac{a}{(z-a)^2}$ d)  $\frac{-1}{(z-q)^2}$ c)  $\frac{z}{(z-a)^2}$ 

The inverse z-transform of  $\frac{z}{z-1}$ , |z| > 1 is \_\_\_\_\_. 7) b) 1 a) -1 d) K c) 0

Max. Marks: 70

Set R

Marks: 14

8) If f(x) = x is represented by Fourier series in  $(-\pi, \pi)$  then \_\_\_\_\_ is the constant term.  $\frac{\pi}{2}$ b) π a) C) 0 d) 2π 9) For Fourier series expansion, function must be a) Harmonic b) Reimann c) Cauchy d) Periodic The Fourier sine transform of  $f(x) = \begin{cases} 1, & 0 \le x < 1 \\ 0, & x > 1 \end{cases}$ a)  $\sqrt{\frac{2}{\pi}}$ b)  $\sqrt{\frac{2}{\pi}} (1 - \cos s)$ 10) d)  $\sqrt{\frac{2}{\pi}} \left(\frac{1-\cos s}{s}\right)$ C)  $\sqrt{\frac{2}{\pi}} \left(\frac{1-\sin s}{s}\right)$ The particular Integral of  $(D + 1)^3 y = e^{-x}$  is \_\_\_\_\_. a)  $\frac{x^3}{2!}e^{-x}$  b)  $\frac{x^2}{2}e^{-x}$ . 11)a)  $\frac{x^3}{3!}e^{-x}$ c)  $xe^x$ d) None of these The complete solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_. 12) a)  $y = (c_1 + c_2 x)e^x + (c_3 + c_4 x)e^{-x}$ b)  $y = (c_1 + c_2)e^x + (c_3 + c_4x)e^{-x}$ c)  $y = (c_1 + c_2 x) \cos \sqrt{3}x + (c_3 + c_4 x) \sin \sqrt{3}x$ d)  $y = (c_1 + c_2 x) \cos 3x + (c_3 + c_4 x) \sin 3x$ 13) The solution of px + qy = z is \_\_\_\_\_ b)  $\phi\left(\frac{x}{y},\frac{y}{z}\right) = 0$ a)  $\phi(x + y, y + z) = 0$ c)  $\phi\left(\frac{x^2}{y}, \frac{y^2}{z}\right) = 0$ d)  $\phi(xy, yz) = 0$ The value of the integral  $\int_{0}^{\infty} e^{-3t} \sin t dt$  is\_\_\_\_\_. a) 5 b)  $\frac{1}{5}$ c) 10 d)  $\frac{1}{10}$ 14)

**SLR-FM-675** 

Set

	SLR-FM-675					
Seat No.	t		Set	R		
		S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III				
Day a Time	& Da : 10:	ate: Saturday, 07-12-2019 Max. :00 AM To 01:00 PM	Mark	s: 56		
Instr	ucti	<ul> <li>ons: 1) Q. No. 5 &amp; Q. 6 are compulsory.</li> <li>2) Solve any two questions from each section.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Use of calculator is allowed.</li> </ul>				
		Section – I				
Q.2	So	Ive any three of the following questions.		09		
	a) b)	Solve $(D^2 + 4)y = \sin^2 x$ Solve $(D^2 + 3D + 2)y = x^2 + 3x + 1$ Solve $(D^2 + 2D + 5)x = x^{-7} \sin 2x$				
	C)	Solve $(D^2 + 2D + 5)y = e^{-x} \sin 2x$ OR				
		Solve $(D^3 + 1)y = 65\cos(2x + 1)$				
Q.3	So	Ive the following questions.		09		
	a) b) c)	z(p2 - q2) = x - y p3 + q3 = 27z px2 + qy2 = (x + y)z				
Q.4	So a)	Ive the following questions. Find $L\{e^{-t}\cos^2 3t\}$		09		
	b)	Find $L\left\{\frac{\cos 6t - \cos 4t}{t}\right\}$				
	c)	Find the laplace transform of the periodic function defined by				
		$f(t) = \frac{\pi c}{T}, 0 < t < T$				
		where $f(t + T) = f(t)$				
Q.5	So a)	Ive the following questions. $(2s^2+5s-4)$		03		
	aj	Find $L^{-1} \left\{ \frac{2^3 + 3^3 + 4}{s^3 + s^2 - 2s} \right\}$		05		
	b)	Using the convolution theorem, find the inverse Laplace transform of $1$		03		
		$(s-1)(s^2+1)$				
	c)	Solve $y'' + 2y' + y = 3t e^{-t}$ , given that $y = 4, y' = 2$ when $t = 0$ using Laplace transform.		04		
	Section – II					
Q.6	a)	Find the unit tangent vector at any point on the curve given by $x = t^2 + 2$ , $y = 4t - 5$ and $z = 2t^2 - 6t$ where t is any variable. Also		04		
	b)	determine unit tangent vector at $t = 2$ . Find the value of constant a, b and c for which vector $\bar{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$ is irrotational		03		

c) Find the angle between the normals to the surface  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at (-1,2,1) 03

			SLR-FM-675	
			Set	R
Q.7	a)	Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) OR		05
	b)	Find the Fourier series of $f(x) = x^2 - 2$ , $-2 \le x \le 2$ Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$		05 04
Q.8	a)	Express $f(x) = \begin{cases} \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$ as a Fourier integral and show that $\int_{0}^{\infty} \frac{\sin wx. \sin \pi w}{1 - w^{2}} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$		03
	b)	Find Fourier sine transform of $f(x) = \begin{cases} \sin x, & 0 < x < 1 \\ 0, & x > 1 \end{cases}$		03
	c)	Find the Fourier transform of $f(x) = \begin{cases} \sqrt{2\pi}, &  x  < a \\ 0, &  x  > a \end{cases}$		03
Q.9	Sol a)	<b>We any three of the following questions.</b> Find the inverse z-transform of $\frac{1}{z^2-3z+2}$ , $ z  > 2$		09
	b)	Find the inverse z-transform of $\frac{z^2}{\left(z-\frac{1}{4}\right)\left(z-\frac{1}{5}\right)}$ , $ z  < \frac{1}{5}$		

**c)** Find 
$$z\left\{3^k \sin\left(\frac{k\pi}{2}\right)\right\}, k \ge 0$$

**d)** Find 
$$z \left\{ 4^k + \frac{1}{4^k} \right\}, k \ge 0$$

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No.	Seat	
	No.	

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III

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) Figures to the right indicate full marks.
- 3) Use of non-programmable calculator is allowed.

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

1)

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

- If  $z\{a^k\} = \frac{z}{z-a}$  then  $z\{k, a^k\} =$  \_\_\_\_\_. a)  $\frac{a}{(z-a)^2}$  b)  $\frac{az}{(z-a)^2}$ c)  $\frac{z}{(z-a)^2}$  d)  $\frac{-1}{(z-a)^2}$
- 2) The inverse z-transform of  $\frac{z}{z-1}$ , |z| > 1 is \_\_\_\_\_. a) -1 b) 1
  - a) -1 b) 1 c) 0 d) K
- 3) If f(x) = x is represented by Fourier series in  $(-\pi, \pi)$  then \_\_\_\_\_ is the constant term.

a) 
$$\frac{\pi}{2}$$
 b)  $\pi$ 

c) 0 d) 
$$2\pi$$

4) For Fourier series expansion, function must be \_\_\_\_\_.a) Harmonic b) Reimann

c) Cauchy d) Periodic

5) The Fourier sine transform of  $f(x) = \begin{cases} 1, & 0 \le x < 1 \\ 0, & x > 1 \end{cases}$  is \_\_\_\_\_. a)  $\sqrt{\frac{2}{\pi}}$  b)  $\sqrt{\frac{2}{\pi}} (1 - \cos s)$ c)  $\sqrt{\frac{2}{\pi}} (\frac{1 - \sin s}{s})$  d)  $\sqrt{\frac{2}{\pi}} (\frac{1 - \cos s}{s})$ 

6) The particular Integral of  $(D + 1)^3 y = e^{-x}$  is \_\_\_\_\_. a)  $\frac{x^3}{3!}e^{-x}$  b)  $\frac{x^2}{2}e^{-x}$ 

- c)  $xe^x$  d) None of these
- 7) The complete solution of  $(D^4 + 6D^2 + 9)y = 0$  is \_\_\_\_\_.
  - a)  $y = (c_1 + c_2 x)e^x + (c_3 + c_4 x)e^{-x}$
  - b)  $y = (c_1 + c_2)e^x + (c_3 + c_4x)e^{-x}$
  - c)  $y = (c_1 + c_2 x) \cos \sqrt{3}x + (c_3 + c_4 x) \sin \sqrt{3}x$
  - d)  $y = (c_1 + c_2 x) \cos 3x + (c_3 + c_4 x) \sin 3x$

Max. Marks: 70

Marks: 14

Set S

## The solution of px + qy = z is \_\_\_\_\_. a) $\phi(x + y, y + z) = 0$ b) $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$ 8) $c) \quad \phi\left(\frac{x^2}{y}, \frac{y^2}{z}\right) = 0$ d) $\phi(xy, yz) = 0$ The value of the integral $\int_{0}^{\infty} e^{-3t} \sin t dt$ is\_\_\_\_\_. 9) b) $\frac{1}{5}$ a) 5 d) $\frac{1}{10}$ c) 10 The Laplace transform of $(\sin t + \cos t)^2$ is \_\_\_\_\_. a) $\frac{1}{2} - \frac{2}{2}$ b) $\frac{1}{s} + \frac{2}{s^2+4}$ . 10) c) $\frac{1}{s} - \frac{2}{s^2 - 4}$ d) $\frac{1}{s} + \frac{2}{s^2 - 4}$ $\frac{1}{(s+3)^2}$ is the Laplace transform of \_\_\_\_\_ 11) b) $t^2 e^{-3t}$ a) $t e^{-3t}$ c) $e^{-3t}$ d) $t e^{3t}$ 12) $L^{-1}\left\{\frac{1}{s^2-6s+25}\right\} =$ \_\_\_\_\_. b) $\frac{e^{-3t}\cos 4t}{4}$ a) $\frac{e^{-3t}}{4}\sin 4t$ c) $e^{-3t} \sin 4t$ d) $e^{3t} \sin 4t$ 13)

13) The directional derivative of  $\phi = xy + yz + zx$  at (1,1,1) is maximum in the direction of \_\_\_\_\_.

a)	l+j+k	D)	l − J + K
C)	2i + 2j + 2k	d)	2i - 2j + 2k

- 14) If  $\bar{r} = xi + yj + zk$  and  $\bar{a}$  is a constant vector then  $\nabla(\bar{a}.\bar{r}) =$ \_\_\_\_\_.
  - a)  $\bar{a}$ b)  $\bar{r}$ c)  $\bar{a}.\bar{r}$ d) 0

**SLR-FM-675** 

Set

	SLR-FM-675				
Seat No.	t	S	et	S	
		S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ENGINEERING MATHEMATICS – III	_		
Day a Time	& Da : 10:	ate: Saturday, 07-12-2019 Max. M :00 AM To 01:00 PM	larks	s: 56	
Instr	ucti	<ul> <li>ons: 1) Q. No. 5 &amp; Q. 6 are compulsory.</li> <li>2) Solve any two questions from each section.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Use of calculator is allowed.</li> </ul>			
		Section – I			
Q.2	So	Ive any three of the following questions.		09	
	a) b)	Solve $(D^2 + 4)y = \sin^2 x$ Solve $(D^2 + 3D + 2)y = x^2 + 3x + 1$ Solve $(D^2 + 2D + 5)y = a^{-x} \sin 2x$			
	C)	OR			
		Solve $(D^3 + 1)y = 65\cos(2x + 1)$			
Q.3	So	Ive the following questions.		09	
	a) b) c)	z(p2 - q2) = x - y p3 + q3 = 27z px2 + qy2 = (x + y)z			
Q.4	So a)	Ive the following questions. Find $L\{e^{-t}\cos^2 3t\}$		09	
	b)	Find $L\left\{\frac{\cos 6t - \cos 4t}{t}\right\}$			
	c)	Find the laplace transform of the periodic function defined by			
		$f(t) = \frac{\pi t}{T}, 0 < t < T$			
		where $f(t+T) = f(t)$			
Q.5	So	Ive the following questions. $(2a^2 + 5a - 4)$		02	
	aj	Find $L^{-1}\left\{\frac{23+33-4}{s^3+s^2-2s}\right\}$		03	
	b)	Using the convolution theorem, find the inverse Laplace transform of $1$		03	
		$(s-1)(s^2+1)$			
	c)	Solve $y'' + 2y' + y = 3t e^{-t}$ , given that $y = 4, y' = 2$ when $t = 0$ using Laplace transform.		04	
	Section – II				
Q.6	a)	Find the unit tangent vector at any point on the curve given by $x = t^2 + 2$ , $y = 4t - 5$ and $z = 2t^2 - 6t$ where t is any variable. Also		04	
	b)	determine unit tangent vector at $t = 2$ . Find the value of constant a, b and c for which vector $\bar{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$ is irrotational		03	

c) Find the angle between the normals to the surface  $x^2y + z = 3$  and  $x \log z - y^2 + 4 = 0$  at (-1,2,1) 03

			SLR-FM-675	
			Set	S
Q.7	a)	Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) OR		05
	b)	Find the Fourier series of $f(x) = x^2 - 2$ , $-2 \le x \le 2$ Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$		05 04
Q.8	a)	Express $f(x) = \begin{cases} \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$ as a Fourier integral and show that $\int_{0}^{\infty} \frac{\sin wx. \sin \pi w}{1 - w^{2}} dw = \begin{cases} \frac{\pi}{2} . \sin x, &  x  < \pi \\ 0, &  x  > \pi \end{cases}$		03
	b)	Find Fourier sine transform of $f(x) = \begin{cases} \sin x, & 0 < x < 1 \\ 0, & x > 1 \end{cases}$		03
	c)	Find the Fourier transform of $f(x) = \begin{cases} \sqrt{2\pi}, &  x  < a \\ 0, &  x  > a \end{cases}$		03
Q.9	Sol a)	<b>Ive any three of the following questions.</b> Find the inverse z-transform of $\frac{1}{z^2-3z+2}$ , $ z  > 2$		09
	b)	Find the inverse z-transform of $\frac{z^2}{\left(z-\frac{1}{4}\right)\left(z-\frac{1}{5}\right)}$ , $ z  < \frac{1}{5}$		

**c)** Find 
$$z\left\{3^k \sin\left(\frac{k\pi}{2}\right)\right\}, k \ge 0$$

**d)** Find 
$$z \left\{ 4^k + \frac{1}{4^k} \right\}, k \ge 0$$

Page **16** of **16** 

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – 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) Assume suitable data if necessary.
- 3) 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
  - An input voltage of 20Vrms is given to voltage doubler circuit. What is the 1) output voltage? b) 40V
    - a) 56.56V
    - c) 28.28V d) None of these
  - 2) Ideal value of Load regulation is \_\_\_\_\_ and ideal value of ripple factor is \_\_\_\_\_.
    - a) Zero, Zero b) Infinite, Infinite
    - c) Infinite, Zero d) Zero, Infinite

3) PIV of diode used in voltage multiplier circuit is \_\_\_\_\_.

- a) 2Vm b) Vm/2
- c) Vm d)  $2Vm/\pi$

4) Back emf in LC filter can be avoided by using

- b) Using capacitor filter a) Inductor filter
- c) Using bleeder resistor d) Using bleeder capacitor
- If one of the diode in center tapped full wave rectifier circuit get damaged 5) it act like \_ b) Half wave rectifier
  - a) Clipper circuit
  - c) Both a & b

d) Cant say

- 6) Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature. b) Triple, 30°C a) Half, 10°C
  - c) Double, 10°C d) Constant, 20°C

7) The critical value of inductance in choke input filter is \_\_\_\_\_.

- b)  $R_L/3\omega$ a)  $3\omega/R_L$
- c)  $3\omega R_{\rm L}$ d) R<sub>L</sub>
- 8) Which are the majority charge carriers in N-channel JFET by enhancing the flow of current between two P-regions or gates?
  - a) Holes b) Electrons c) Both a & b
    - d) None of the above
- Which region is lightly doped with an impurity by forming PN junctions in 9) JFET?
  - a) Source
  - c) Gate

- b) Drain
- d) Channel

## **SLR-FM-676**

Max. Marks: 70

Marks: 14

Set P

- Icbo in transistor can be reduced by reducing \_\_\_\_\_. 10)
  - a) I<sub>B</sub>
    - b) I<sub>E</sub> d) Temperature
  - c) Vcc
  - In a tansistor,  $I_c = 100$  mA and  $I_E = 100.2$  mA. The value of  $\beta$  is \_\_\_\_\_. b) 200 a) 100

    - c) about 1
- 12) The voltage gain of a transistor connected in common collector arrangement are \_\_\_\_\_.

d) 50

a) equal to 1 c) less than 1

11)

- b) more than 10
- d) more than 100
- The Early Effect is also called as \_ 13)
  - a) Base-width modulation effect b) Base-width amplification effect
  - c) Punch through effect
- d) None of the mentioned

14) BC 147 transistor indicates that it is made of \_\_\_\_\_

- a) germanium
- c) carbon

- b) silicon
- d) none of the above

## Seat No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day & Date: Tuesday, 10-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Assume the suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

## Section – I

## Q.2 Solve any Four.

- a) What is the difference between normal PN junction diode and zener diode? Explain with the help of V-I characteristics.
- **b)** Explain with neat circuit diagram working of voltage tripler. Does this circuit provides power multiplication also?
- c) Explain the working of the circuit shown in fig. 1 and draw output waveform.

- d) Derive expression for efficiency and ripple factor for center tapped full wave rectifier.
- e) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.

## Q.3 Solve any Two.

- a) Design unregulated power supply with two diode and CLC filter to provide 21V and 10mA current, ripple content in the output must be less than 1%.
- **b)** What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. What are the applications of Clamper circuit?
- c) Explain junction capacitances of diode and derive expression for diffusion capacitance.

### Section – II

## Q.4 Attempt any Four.

- Calculate Q point coordinates for collector to base biasing circuit for Si transistor with
  - $R_{C} = 1 \text{ K}\Omega, R_{B} = 100 \text{ K}\Omega \text{ Vcc} = 12 \text{ V}, \beta \text{dc} = 100.$
- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain stabilization of Q point for voltage divider biasing circuit.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.



PN Ideal IK Vo



#### **- I** Max. Marks: 56

16

SLR-FM-676

Set

## Q.5 Attempt any Two.

- a) Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vo peak = 4V and stability factor S=10. Assume hfe=45, hie =  $1.4K\Omega$ .
- **b)** Consider transistor CE amplifier with  $R_L = 2.7K\Omega$ , hie=4.5KΩ, hre=2 X 10<sup>-4</sup>, hfe=-330, hoe=30µ𝔅. Calculate Ai, Av, Ri, Ro.
- c) Explain Common Source JFET amplifier with its basic parameters.
|               |                   | ELECT  | <b>RONICS CI</b>   | RCUIT ANAL   | YSIS AND DESIGN – I  |        |
|---------------|-------------------|--|--|--|--|--------|
| Day &<br>Time | & Date<br>: 10:00 | Max. Mark  | (s: 70   |  |  |        |
| Instr         | uctior            | <b>ns:</b> 1) Q. N<br>book<br>2) Assu<br>3) Figu                   | o. 1 is compul<br><br>ume suitable d<br>res to the righ      | sory and should<br>ata if necessary<br>t indicate full ma                  | d be solved in first 30 minutes in ans<br>/.<br>arks.  | swer   |
|               |                   |  | MCQ/(  | Objective Type   | Questions  |        |
| Durat         | tion: 3           | 0 Minutes  |  |  | Mark   | (s: 14 |
| Q.1           | <b>Choo</b><br>1) | <b>Se the co</b><br>Which are<br>the flow o<br>a) Holes<br>c) Both | rrect alternat<br>the majority of<br>f current betw<br>a & b | <b>ives from the o</b><br>charge carriers i<br>een two P-regio<br>b)<br>d) | options and rewrite the sentence.<br>in N-channel JFET by enhancing<br>ons or gates?<br>Electrons<br>None of the above | 14     |
|               | 2)                | Which reg<br>JFET?<br>a) Sourc<br>c) Gate                          | jion is lightly c<br>ce                                      | loped with an im<br>b)<br>d)   | npurity by forming PN junctions in<br>Drain<br>Channel   |        |
|               | 3)                | Icbo in tra<br>a) I <sub>B</sub><br>c) Vcc                         | nsistor can be   | e reduced by rec<br>b)<br>d)   | ducing<br>I <sub>E</sub><br>Temperature  |        |
|               | 4)                | In a tansis  | stor, $I_c = 100$  | mA and $I_{\rm F} = 1$   | .00.2 mA. The value of $\beta$ is .  |        |

	c) about 1	d) 50	
5)	The voltage gain of a trans	istor connected in common collector arrang	ement
	are		

b)

- סוג
  - equal to 1 more than 10 b) a) less than 1 d) more than 100 C)
- The Early Effect is also called as \_ 6) Base-width modulation effect a) b) Base-width amplification effect Punch through effect C)
  - d) None of the mentioned

200

BC 147 transistor indicates that it is made of \_\_\_\_ 7)

- a) germanium b) silicon c) carbon d) none of the above
- An input voltage of 20Vrms is given to voltage doubler circuit. What is the 8) output voltage?
  - a) 56.56V b) 40V c) 28.28V
- 9) Ideal value of Load regulation is \_\_\_\_\_ and ideal value of ripple factor is \_\_\_\_\_.
  - a) Zero, Zero
  - c) Infinite, Zero

d) None of these

b) Infinite, Infinite

d) Zero, Infinite

**SLR-FM-676** 

Set

Seat No.

# S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

100

a)

ks: 70

- Set Q
- 10) PIV of diode used in voltage multiplier circuit is \_\_\_\_\_.
  - a) 2Vm b) Vm/2
  - c) Vm d)  $2Vm/\pi$
- Back emf in LC filter can be avoided by using \_\_\_\_\_ 11)
  - a) Inductor filter
  - c) Using bleeder resistor
- b) Using capacitor filter

.

- d) Using bleeder capacitor
- If one of the diode in center tapped full wave rectifier circuit get damaged 12) it act like .
  - a) Clipper circuit

c) Both a & b

- b) Half wave rectifier
- d) Cant say
- 13) Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature. a) Half, 10°C
  - b) Triple, 30°C
  - c) Double, 10°C d) Constant, 20°C
- 14) The critical value of inductance in choke input filter is \_\_\_\_\_.
  - a)  $3\omega/R_L$
  - c)  $3\omega R_L$

b)  $R_L/3\omega$ d) R<sub>L</sub>

## Seat No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day & Date: Tuesday, 10-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Assume the suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

2V

### Section – I

## Q.2 Solve any Four.

- a) What is the difference between normal PN junction diode and zener diode? Explain with the help of V-I characteristics.
- **b)** Explain with neat circuit diagram working of voltage tripler. Does this circuit provides power multiplication also?
- c) Explain the working of the circuit shown in fig. 1 and draw output waveform.

- **d)** Derive expression for efficiency and ripple factor for center tapped full wave rectifier.
- e) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.

## Q.3 Solve any Two.

- a) Design unregulated power supply with two diode and CLC filter to provide 21V and 10mA current, ripple content in the output must be less than 1%.
- **b)** What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. What are the applications of Clamper circuit?
- c) Explain junction capacitances of diode and derive expression for diffusion capacitance.

### Section – II

## Q.4 Attempt any Four.

- a) Calculate Q point coordinates for collector to base biasing circuit for Si transistor with
  - $R_{C} = 1 \text{ K}\Omega, R_{B} = 100 \text{ K}\Omega \text{ Vcc} = 12 \text{ V}, \beta \text{dc} = 100.$
- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain stabilization of Q point for voltage divider biasing circuit.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.



Max. Marks: 56

Set Q

**SLR-FM-676** 

16



1k

## Q.5 Attempt any Two.

- a) Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vo peak = 4V and stability factor S=10. Assume hfe=45, hie =  $1.4K\Omega$ .
- **b)** Consider transistor CE amplifier with R<sub>L</sub> = 2.7KΩ, hie=4.5KΩ, hre=2 X 10<sup>-4</sup>, hfe=-330, hoe=30μℑ. Calculate Ai, Av, Ri, Ro.
- c) Explain Common Source JFET amplifier with its basic parameters.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – 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) Assume suitable data if necessary.
- 3) 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

- If one of the diode in center tapped full wave rectifier circuit get damaged 1) it act like
  - a) Clipper circuit
  - c) Both a & b d) Cant say
- 2) Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature. a) Half, 10°C
  - b) Triple, 30°C

b) Half wave rectifier

- c) Double, 10°C d) Constant, 20°C
- 3) The critical value of inductance in choke input filter is \_\_\_\_\_.
  - a)  $3\omega/R_L$ b)  $R_L/3\omega$
  - d) R<sub>L</sub> c)  $3\omega R_{\rm L}$
- Which are the majority charge carriers in N-channel JFET by enhancing 4) the flow of current between two P-regions or gates?
  - a) Holes b) Electrons
  - c) Both a & b d) None of the above
- Which region is lightly doped with an impurity by forming PN junctions in 5) JFET?
  - a) Source b) Drain
  - c) Gate d) Channel

6) Icbo in transistor can be reduced by reducing \_\_\_\_\_.

- a) I<sub>B</sub> b) I<sub>E</sub> d) Temperature c) Vcc
- In a tansistor,  $I_c = 100$  mA and  $I_E = 100.2$  mA. The value of  $\beta$  is \_\_\_\_\_. 7) 100 b) 200 a)
  - c) about 1 d) 50
- The voltage gain of a transistor connected in common collector arrangement 8) are \_\_\_\_\_.
  - a) equal to 1 b) more than 10 less than 1 d) more than 100 C)
- 9) The Early Effect is also called as \_\_\_\_\_
  - Base-width modulation effect b) Base-width amplification effect a)
  - Punch through effect d) None of the mentioned c)

**SLR-FM-676** 

Max. Marks: 70

Marks: 14

Set R

- 10) BC 147 transistor indicates that it is made of \_\_\_\_\_.
  - a) germanium
- b) silicon
- c) carbon d) none of the above
- 11) An input voltage of 20Vrms is given to voltage doubler circuit. What is the output voltage?
  - a) 56.56V

c) 28.28V

- b) 40V
- d) None of these
- 12) Ideal value of Load regulation is \_\_\_\_\_ and ideal value of ripple factor is \_\_\_\_\_.
  - a) Zero, Zero b) Infinite, Infinite
  - c) Infinite, Zero d) Zero, Infinite
- 13) PIV of diode used in voltage multiplier circuit is \_\_\_\_\_.
  - a) 2Vm b) Vm/2
  - c) Vm d)  $2Vm/\pi$
- 14) Back emf in LC filter can be avoided by using \_
  - a) Inductor filterc) Using bleeder resistor
- by using \_\_\_\_\_. b) Using capacitor filter
- d) Using bleeder capacitor

## Seat No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day & Date: Tuesday, 10-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Assume the suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

### Section – I

## Q.2 Solve any Four.

- a) What is the difference between normal PN junction diode and zener diode? Explain with the help of V-I characteristics.
- **b)** Explain with neat circuit diagram working of voltage tripler. Does this circuit provides power multiplication also?
- c) Explain the working of the circuit shown in fig. 1 and draw output waveform.

- d) Derive expression for efficiency and ripple factor for center tapped full wave rectifier.
- e) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.

## Q.3 Solve any Two.

- a) Design unregulated power supply with two diode and CLC filter to provide 21V and 10mA current, ripple content in the output must be less than 1%.
- **b)** What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. What are the applications of Clamper circuit?
- c) Explain junction capacitances of diode and derive expression for diffusion capacitance.

### Section – II

## Q.4 Attempt any Four.

- Calculate Q point coordinates for collector to base biasing circuit for Si transistor with
  - $R_{C} = 1 \text{ K}\Omega$ ,  $R_{B} = 100 \text{ K}\Omega \text{ Vcc} = 12 \text{ V}$ ,  $\beta dc = 100$ .
- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain stabilization of Q point for voltage divider biasing circuit.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.



12





Max. Marks: 56

**SLR-FM-676** 

## Q.5 Attempt any Two.

- a) Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vo peak = 4V and stability factor S=10. Assume hfe=45, hie = 1.4K $\Omega$ .
- **b)** Consider transistor CE amplifier with R<sub>L</sub> = 2.7KΩ, hie=4.5KΩ, hre=2 X 10<sup>-4</sup>, hfe=-330, hoe=30μΰ. Calculate Ai, Av, Ri, Ro.
- c) Explain Common Source JFET amplifier with its basic parameters.

			MCQ/Objective I	ype	Questions
Dura	ition: 3	30 Mi	inutes		Marks: 14
Q.1	<b>Cho</b> 1)	ose Icb a) c)	the correct alternatives from the correct alternatives from the reduced by $I_B$ Vcc	<b>he o</b> ∕ red b) d)	ptions and rewrite the sentence. 14 lucing I <sub>E</sub> Temperature
	2)	In a a) c)	tansistor, $\rm I_{c}=100~mA$ and $\rm I_{E}$ 100 about 1	= 1( b) d)	00.2 mA. The value of β is 200 50
	3)	The are a) c)	e voltage gain of a transistor con  equal to 1 less than 1	necte b) d)	ed in common collector arrangement more than 10 more than 100
	4)	The a) c)	Early Effect is also called as Base-width modulation effect Punch through effect	b) d)	 Base-width amplification effect None of the mentioned
	5)	BC a) c)	147 transistor indicates that it is germanium carbon	mac b) d)	le of silicon none of the above
	6)	An out a) c)	input voltage of 20Vrms is given put voltage? 56.56V 28.28V	b) d)	oltage doubler circuit. What is the 40V None of these
	7)	lde a) c)	al value of Load regulation is Zero, Zero Infinite, Zero	b) d)	and ideal value of ripple factor is Infinite, Infinite Zero, Infinite
	8)	PI∖ a) c)	<ul> <li>of diode used in voltage multipl</li> <li>2Vm</li> <li>Vm</li> </ul>	ier c b) d)	ircuit is Vm/2 2Vm/π
	9)	Bao a) c)	ck emf in LC filter can be avoide Inductor filter Using bleeder resistor	d by b) d)	using Using capacitor filter Using bleeder capacitor

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - I**

Day & Date: Tuesday, 10-12-2019 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.
- 3) Figures to the right indicate full marks.

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## **SLR-FM-676**

Set

Max. Marks: 70



- If one of the diode in center tapped full wave rectifier circuit get damaged 10) it act like
  - a) Clipper circuit

- b) Half wave rectifier
- c) Both a & b
- d) Cant say
- Reverse saturation current gets \_\_\_\_\_ for every \_\_\_\_\_ rise in temperature. 11)
  - a) Half, 10°C b) Triple, 30°C c) Double, 10°C
    - d) Constant, 20°C
- 12) The critical value of inductance in choke input filter is \_\_\_\_\_.
  - a)  $3\omega/R_L$ b)  $R_L/3\omega$ c)  $3\omega R_L$ 
    - d) R<sub>L</sub>
- Which are the majority charge carriers in N-channel JFET by enhancing 13) the flow of current between two P-regions or gates?
  - b) Electrons a) Holes
  - c) Both a & b d) None of the above
- 14) Which region is lightly doped with an impurity by forming PN junctions in JFET?
  - a) Source
  - c) Gate

- b) Drain
- d) Channel

## Seat No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I

Day & Date: Tuesday, 10-12-2019

Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

- 2) Assume the suitable data whenever necessary.
- 3) Figures to the right indicate full marks.

## Section – I

## Q.2 Solve any Four.

- a) What is the difference between normal PN junction diode and zener diode? Explain with the help of V-I characteristics.
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- e) Calculate value of reverse saturation current for Silicon diode at room temperature when applied voltage is 5V and forward current through diode is 1A.

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- a) Design unregulated power supply with two diode and CLC filter to provide 21V and 10mA current, ripple content in the output must be less than 1%.
- **b)** What is clamper? Explain working of positive clamper with neat circuit diagram and waveform. What are the applications of Clamper circuit?
- c) Explain junction capacitances of diode and derive expression for diffusion capacitance.

### Section – II

## Q.4 Attempt any Four.

- Calculate Q point coordinates for collector to base biasing circuit for Si transistor with
  - $R_{C} = 1 \text{ K}\Omega, R_{B} = 100 \text{ K}\Omega \text{ Vcc} = 12 \text{ V}, \beta \text{dc} = 100.$
- **b)** Justify output voltage signal is 180° out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.
- c) Explain stabilization of Q point for voltage divider biasing circuit.
- d) Explain effect of Gate to source voltage on channel conductivity for JFET.
- e) Explain high frequency response of BJT amplifier.



12





**SLR-FM-676** 



## Q.5 Attempt any Two.

- a) Design a single stage CE amplifier with voltage divider bias to give voltage gain of 40, Vo peak = 4V and stability factor S=10. Assume hfe=45, hie = 1.4K $\Omega$ .
- **b)** Consider transistor CE amplifier with  $R_L = 2.7K\Omega$ , hie=4.5KΩ, hre=2 X 10<sup>-4</sup>, hfe=-330, hoe=30µ𝔅. Calculate Ai, Av, Ri, Ro.
- c) Explain Common Source JFET amplifier with its basic parameters.

Seat No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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.

2) Figures to the right indicate full marks.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

a)

1)

Marks: 14

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

- The superposition theorem is applicable on \_\_\_\_\_.
  - a) Both Linear and non linear circuits
  - b) Linear circuits only
  - c) Non Linear circuits only
  - d) None of the above
- 2) For maximum transfer of power the source resistance must be \_\_\_\_\_
  - Equal to load resistance b) less than load resistance
  - Greater than load resistance None of the above d) C)
- 3) If the value of resonant frequency is 50 kHz in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of quality factor?
  - a) 5 50 b)
  - c) 100 d) 500
- What would be the value of impedance of a parallel resonant circuit at anti 4) resonance condition?
  - Resistive & maximum b) Resistive & minimum a)
  - Reactive & minimum Reactive & maximum d) C)
- How is the short circuit reverse transfer admittance (Y<sub>12</sub>) calculated? 5) 12/V1 (keeping V2=0)
  - a) V2/11 (keeping 12 = 0) b) c) 11/V2 (keeping V1 = 0)
    - V1/12 (keeping 11 =0) d)
- In a certain series resonant circuit,  $V_c = 125V$ .  $V_{\perp} = 125V$ , and  $V_R = 40V$ . 6) The value of the source voltage is
  - b) a) 50V 125V 250V
  - c) 40V d)
- 7) Which elements act as independent variables in Z-parameters? a)
  - Current b) Voltage
  - Both a and b None of the above d) C)
- In RC series circuit R =  $2\Omega$ , C =  $2\mu$ F and 10V dc is applied. Then what is 8) the value of current at steady state?
  - a) 0A 5 A b)
    - 10A 20A d) c)



Max. Marks: 70

9) Time constant of RL series circuit is \_\_\_\_

- a) 2L/R b) L/R
- c) RL d) R/L

10) Transients are presents in the circuit when the circuit is having \_\_\_\_\_.

b)

L

- a) R
- c) C d)

Either L or C

**SLR-FM-677** 

Set

- 11) An ideal filter is one which \_\_\_\_\_.
  - a) Zero attenuation in pass band
  - b) Infinite attenuation in pass band
  - c) No attenuation in stop band
  - d) None of the above
- 12) A band elimination filter is one which \_\_\_\_
  - a) Attenuates ail frequencies less than lower cut off frequency
  - b) Attenuates all frequencies greater than lower cut off frequency
  - c) Attenuates all frequencies between lower and higher cut off frequency
  - d) None of the above

### 13) Relation between neper and decibel is \_\_\_\_

- a) N=log(attn in dB/20)
- b) N=log(20/ attn in dB)
- c) N=antilog (attn in dB/20) d) N=antilog (20/attn in dB)
- 14) The driving point impedance is defined as \_\_\_\_\_
  - a) Ratio of transform voltage to transform current at same port
  - b) Ratio of transform voltage at one port to transform current at other port
  - c) Both a and b
  - d) None of the above



Seat

No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

#### Answer any four from the following questions. Q.2

- a) Find the Norton equivalent circuit between the points A and B in figure 1?
  - 52 22 OR 101 ( 5A tique 1

12

figure 2

32

11

Find in 1 figure 2 using superposition theorem? b) ₹ 2.2 152

A

114



Find Y-parameters for the network shown in figure 3. d)



Derive h-parameters for two port network in terms of voltage. Current and e) draw h-parameter equivalent circuit.

Max. Marks: 56

Set

### Q.3 Answer any two from the following questions

a) Find the value of R in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to R?

51

152



- **b)** Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.
- c) Determine Z parameters for  $\pi$  type network shown in figure 5.



w

a) Determine the current i(t) for  $t \ge 0$  if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.

Section – II



- **b)** Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.
- c) Plot the pole zero diagram for H(s) = 2s / [(s+2)(s+2)(s+2)]
- d) Design a k-type high-pass filter (T and  $\pi$ ) with, a cut-off frequency of 1kHz with a terminated design impedance of 800  $\Omega$
- A series RL circuit with R=30 Ω and L = 15H has a constant voltage V= 60V applied at t = 0as shown in figure 7. Determine the current i(t) and the voltage v(t) across the resistance





16



## Q.5 Answer any two from the following questions

- a) Explain the concept of complex frequency and significance of poles and zeros.
- **b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c) Design a k-type band pass T and  $\pi$  type filter having a design impedance of 500 $\Omega$  and cut-off frequencies 1kHz and 10kHz.

12

## SLR-FM-677 Set P

## Seat No. S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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.

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 RC series circuit R =  $2\Omega$ , C =  $2\mu$ F and 10V dc is applied. Then what is 1) the value of current at steady state?

a)	0A	•	b)	5 A
c)	20A		d)	10A

- 2) Time constant of RL series circuit is
  - a) 2L/R b) L/R c) RL
    - d) R/L

### 3) Transients are presents in the circuit when the circuit is having \_\_\_\_\_.

- a) R b) L c) C
- 4) An ideal filter is one which
  - a) Zero attenuation in pass band
  - b) Infinite attenuation in pass band
  - c) No attenuation in stop band
  - d) None of the above
- A band elimination filter is one which . 5)
  - a) Attenuates ail frequencies less than lower cut off frequency
  - b) Attenuates all frequencies greater than lower cut off frequency
  - c) Attenuates all frequencies between lower and higher cut off frequency
  - d) None of the above

### 6) Relation between neper and decibel is

- N=log(attn in dB/20) b) N=log(20/ attn in dB) a)
- c) N=antilog (attn in dB/20) N=antilog (20/attn in dB) d)
- 7) The driving point impedance is defined as
  - Ratio of transform voltage to transform current at same port a)
  - Ratio of transform voltage at one port to transform current at other b) port
  - Both a and b c)
  - d) None of the above

**SLR-FM-677** 



Max. Marks: 70

Marks: 14

- Either L or C
- d)

8)	The a) b) c) d)	e superposition theorem is applica Both Linear and non linear circu Linear circuits only Non Linear circuits only None of the above	able o its	n
9)	For a) c)	maximum transfer of power the s Equal to load resistance Greater than load resistance	sourc b) d)	e resistance must be less than load resistance None of the above
10)	If th with fact a)	ne value of resonant frequency is in the bandwidth of about 1 kHz, th or? 5	50 k nen w b)	Hz in a series RLC circuit along what would be the value of quality
	c)	100	d)	500
11)	Wh reso	at would be the value of impedan onance condition?	ice of	a parallel resonant circuit at anti
	a) c)	Resistive & maximum Reactive & maximum	b) d)	Resistive & minimum Reactive & minimum
12)	Hov a) c)	w is the short circuit reverse trans V2/11 (keeping 12 =0) 11/ V2 (keeping V1 = 0)	fer ac b) d)	dmittance (Y <sub>12</sub> ) calculated? 12/V1 (keeping V2=0) V1/12 (keeping 11 =0)
13)	In a The a) c)	a certain series resonant circuit, V e value of the source voltage is 50V 40V	/ <sub>c</sub> = 12  b) d)	25V. $V_{L} = 125V$ , and $V_{R} = 40V$ . 125V 250V
	,			

- 14) Which elements act as independent variables in Z-parameters?
  - a) Current b) Voltage
  - c) Both a and b

d) None of the above

SLR-FM-677

Set Q



## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

#### Answer any four from the following questions. Q.2

a) Find the Norton equivalent circuit between the points A and B in figure 1?



Find in 1 figure 2 using superposition theorem? b) ₹ 2.2 152

A

114



12

32

11

Find Y-parameters for the network shown in figure 3. d)



Derive h-parameters for two port network in terms of voltage. Current and e) draw h-parameter equivalent circuit.

Max. Marks: 56

Set

## Q.3 Answer any two from the following questions

a) Find the value of R in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to R?



- **b)** Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.
- c) Determine Z parameters for  $\pi$  type network shown in figure 5.



### Section – II

### Q.4 Answer any four from the following questions

a) Determine the current i(t) for  $t \ge 0$  if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.



- **b)** Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.
- c) Plot the pole zero diagram for H(s) = 2s / [(s+2)(s+2)(s+2)]
- d) Design a k-type high-pass filter (T and  $\pi$ ) with, a cut-off frequency of 1kHz with a terminated design impedance of 800  $\Omega$
- A series RL circuit with R=30 Ω and L = 15H has a constant voltage V= 60V applied at t = 0as shown in figure 7. Determine the current i(t) and the voltage v(t) across the resistance



figure 7



SLR-FM-6	77
Set	Q

## Q.5 Answer any two from the following questions

- a) Explain the concept of complex frequency and significance of poles and zeros.
- **b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c) Design a k-type band pass T and  $\pi$  type filter having a design impedance of 500 $\Omega$  and cut-off frequencies 1kHz and 10kHz.

12

## SLR-FM-677 Set Q

How is the short circuit reverse transfer admittance  $(Y_{12})$  calculated? a) V2/11 (keeping 12 =0) 12/V1 (keeping V2=0) b) c) 11/V2 (keeping V1 = 0) V1/12 (keeping 11 =0) d) In a certain series resonant circuit,  $V_c = 125V$ .  $V_{\perp} = 125V$ , and  $V_{R} = 40V$ . The value of the source voltage is a) 50V b) 125V c) 40V d) 250V Which elements act as independent variables in Z-parameters? a) Current Voltage b) d) None of the above In RC series circuit R =  $2\Omega$ , C =  $2\mu$ F and 10V dc is applied. Then what is 0A b) 5 A 20A 10A d) b) L/R c) RL d) R/L b) L d) Either L or C Attenuates ail frequencies less than lower cut off frequency

## **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS** Day & Date: Thursday, 12-12-2019

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

Time: 10:00 AM To 01:00 PM

**Duration: 30 Minutes** 

1)

2)

3)

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.

## MCQ/Objective Type Questions

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

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## **SLR-FM-677**



Seat No.

- c) Both a and b
- 4) the value of current at steady state?
  - a) c)
- Time constant of RL series circuit is 5)
  - a) 2L/R

6) Transients are presents in the circuit when the circuit is having \_\_\_\_\_

- a) R
- c) C
- 7) An ideal filter is one which
  - a) Zero attenuation in pass band
  - b) Infinite attenuation in pass band
  - c) No attenuation in stop band
  - d) None of the above
- 8) A band elimination filter is one which
  - a)
  - b) Attenuates all frequencies greater than lower cut off frequency
  - c) Attenuates all frequencies between lower and higher cut off frequency
  - d) None of the above

Marks: 14

- Relation between neper and decibel is
- a) N=log(attn in dB/20)
- $N = \log(20/ \text{ attn in } dB)$ b)

Set

- c) N=antilog (attn in dB/20)
- d) N=antilog (20/attn in dB)
- The driving point impedance is defined as \_\_\_\_\_ 10)
  - Ratio of transform voltage to transform current at same port a)
  - Ratio of transform voltage at one port to transform current at other b) port
  - Both a and b c)

9)

- d) None of the above
- 11) The superposition theorem is applicable on \_\_\_\_\_.
  - a) Both Linear and non linear circuits
  - b) Linear circuits only
  - c) Non Linear circuits only
  - d) None of the above
- For maximum transfer of power the source resistance must be \_\_\_\_\_. 12)
  - a) Equal to load resistance
- b) less than load resistance
- c) Greater than load resistance d) None of the above
- 13) If the value of resonant frequency is 50 kHz in a series RLC circuit along with the bandwidth of about 1 kHz, then what would be the value of quality factor?
  - 5 50 a) b)
  - 100 d) 500 C)
- What would be the value of impedance of a parallel resonant circuit at anti 14) resonance condition?
  - a) Resistive & maximum
- **Resistive & minimum** b)
- c) Reactive & maximum
- d) Reactive & minimum



## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

#### Answer any four from the following questions. Q.2

a) Find the Norton equivalent circuit between the points A and B in figure 1?



12

32

11

Find in 1 figure 2 using superposition theorem? b) ₹ 2.2 152

A

114



Find Y-parameters for the network shown in figure 3. d)



Derive h-parameters for two port network in terms of voltage. Current and e) draw h-parameter equivalent circuit.

Max. Marks: 56

Set

### Q.3 Answer any two from the following questions

a) Find the value of R in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to R?

152



51

- **b)** Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.
- c) Determine Z parameters for  $\pi$  type network shown in figure 5.



a) Determine the current i(t) for  $t \ge 0$  if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.



- b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.
- c) Plot the pole zero diagram for H(s) = 2s / [(s+2)(s+2)(s+2)]
- d) Design a k-type high-pass filter (T and  $\pi$ ) with, a cut-off frequency of 1kHz with a terminated design impedance of 800  $\Omega$
- A series RL circuit with R=30 Ω and L = 15H has a constant voltage V= 60V applied at t = 0as shown in figure 7. Determine the current i(t) and the voltage v(t) across the resistance





Set



## Q.5 Answer any two from the following questions

- a) Explain the concept of complex frequency and significance of poles and zeros.
- **b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c) Design a k-type band pass T and  $\pi$  type filter having a design impedance of 500 $\Omega$  and cut-off frequencies 1kHz and 10kHz.

12

## SLR-FM-677 Set R

### Seat No.

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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.

2) 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
  - Transients are presents in the circuit when the circuit is having \_\_\_\_\_.
    - a) R b)
    - c) C d) Either L or C
  - An ideal filter is one which \_\_\_\_ 2)
    - a) Zero attenuation in pass band
    - b) Infinite attenuation in pass band
    - c) No attenuation in stop band
    - d) None of the above

### A band elimination filter is one which 3)

- a) Attenuates ail frequencies less than lower cut off frequency
- b) Attenuates all frequencies greater than lower cut off frequency
- c) Attenuates all frequencies between lower and higher cut off frequency
- d) None of the above
- Relation between neper and decibel is 4)
  - N=log(20/ attn in dB) a) N=log(attn in dB/20) b)
  - c) N=antilog (attn in dB/20)
- d) N=antilog (20/attn in dB)
- The driving point impedance is defined as 5)
  - Ratio of transform voltage to transform current at same port a)
    - Ratio of transform voltage at one port to transform current at other b) port
    - Both a and b c)
    - d) None of the above
- 6) The superposition theorem is applicable on \_\_\_\_\_.
  - a) Both Linear and non linear circuits
  - b) Linear circuits only
  - c) Non Linear circuits only
  - d) None of the above
- For maximum transfer of power the source resistance must be \_\_\_\_ 7)
  - Equal to load resistance less than load resistance b) a)
  - c) Greater than load resistance d) None of the above



Max. Marks: 70

Marks: 14

L

				Set	S
8)	lf th with fac	ne value of resonant frequency is n the bandwidth of about 1 kHz, th tor?	50 k nen w	Hz in a series RLC circuit along hat would be the value of quality	
	a) c)	5 100	b) d)	50 500	
9)	Wh	at would be the value of impedan onance condition?	ce of	a parallel resonant circuit at anti	
	a) c)	Resistive & maximum Reactive & maximum	b) d)	Resistive & minimum Reactive & minimum	
10)	Ho a) c)	w is the short circuit reverse trans V2/11 (keeping 12 =0) 11/ V2 (keeping V1 = 0)	fer ac b) d)	dmittance (Y <sub>12</sub> ) calculated? 12/V1 (keeping V2=0) V1/12 (keeping 11 =0)	
11)	In a The a) c)	a certain series resonant circuit, V e value of the source voltage is 50V 40V	b) d)	25V. $V_L = 125V$ , and $V_R = 40V$ . 125V 250V	
12)	Wh a) c)	ich elements act as independent Current Both a and b	variat b) d)	oles in Z-parameters? Voltage None of the above	
13)	In F the a) c)	RC series circuit R = $2\Omega$ , C = $2\mu$ F value of current at steady state? 0A 20A	and 1 b) d)	10V dc is applied. Then what is 5 A 10A	
4 4)	, T:		,		

14) Time constant of RL series circuit is \_\_\_\_. a) 2L/R b) L/R c) RL d) R/L SLR-FM-677



## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering CIRCUITS & NETWORKS**

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

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

#### Answer any four from the following questions. Q.2

a) Find the Norton equivalent circuit between the points A and B in figure 1?



Find in 1 figure 2 using superposition theorem? b) ₹ 2.2 152

A

114



12

32

11

Find Y-parameters for the network shown in figure 3. d)



Derive h-parameters for two port network in terms of voltage. Current and e) draw h-parameter equivalent circuit.

Max. Marks: 56

Set

## Q.3 Answer any two from the following questions

a) Find the value of R in figure 4 for which maximum power transfer takes place and hence find the maximum power delivered to R?



- **b)** Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.
- c) Determine Z parameters for  $\pi$  type network shown in figure 5.



a) Determine the current i(t) for  $t \ge 0$  if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.

Section – II



- b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of  $500\Omega$  impedance.
- c) Plot the pole zero diagram for H(s) = 2s / [(s+2)(s+2)(s+2)]
- d) Design a k-type high-pass filter (T and  $\pi$ ) with, a cut-off frequency of 1kHz with a terminated design impedance of 800  $\Omega$
- A series RL circuit with R=30 Ω and L = 15H has a constant voltage V= 60V applied at t = 0as shown in figure 7. Determine the current i(t) and the voltage v(t) across the resistance







**SLR-FM-677** 

Set

Page **20** of **20** 

### Q.5 Answer any two from the following questions

- a) Explain the concept of complex frequency and significance of poles and zeros.
- **b)** Derive the expression for step response (current) for series RL circuit. Also derive the expression for time constant.
- c) Design a k-type band pass T and  $\pi$  type filter having a design impedance of 500 $\Omega$  and cut-off frequencies 1kHz and 10kHz.

12

## SLR-FM-677 Set S

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering DIGITAL TECHNIQUES**

Day & Date: Saturday, 14-12-2019 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.
- 4) Assume suitable data if necessary.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- In a four variable K-map eight adjacent cells give \_\_\_\_ 1)
  - a) Single variable term
  - c) Three variable term
- b) Two variable term Four variable term d)
- 2) In a 4 bit full adder how many half adders and OR gates are required? 7 and 4
  - a) 8 and 4 b)
  - c) 7 and 3 d) 8 and 3
- Consider the following statements for a multiplexer \_\_\_\_ 3)
  - selects one of the several inputs and steers it to the output i)
  - routes the data from a single input to many outputs ii)
  - converts parallel data into serial data iii)
  - is a combinational circuit iv)

Which of the above is correct for a Multiplexer?

- a) i, ii, iii i, iii, iv b)
- c) i, ii, iv ii, iii, iv d)
- 4) Consider the following statements.
  - ECL has least propagation delay i)
  - TTL has largest fan out ii)
  - CMOS has highest noise margin iii)
  - TTL has lowest power dissipation iv)

Which of the following are correct for above statements?

- a) i&iii ii & iv b) c) iii & iv d) i&ii
- 5) A JK flip flop can be converted to D flip flop by, .
  - a) Connecting both J and K terminals to D
  - b) Connecting J terminal to D and leaving K open
  - c) Connecting K terminal to D and leaving J open
  - d) Connecting J terminal to D and K terminal to D through an inverter
- How many NAND gates are used to construct Active High S-R flip flop? 6)
  - a) 5 b) 3
  - c) 4 8 d)

Max. Marks: 70

Marks: 14



		SLR-FM-678
		Set P
7)	In comparison with Serial adder the Pa a) is slower b) c) is faster d)	rallel adder has same speed has delayed output
8)	Maximum MOD number for a 2-bit bina a) 4 b) c) 8 d)	ry counter is 3 16
9)	To serially shift a 5-bit of data into a sh a) 1 clock pulse b) c) 5 clock pulses d)	ift register, there must be 4 clock pulses 1 clock pulse for each 1
10)	<ul> <li>To operate correctly, starting a ring cou</li> <li>a) presetting all the flip-flops</li> <li>b) clearing all the flip-flops</li> <li>c) presetting one flip-flop and clearing</li> <li>d) none of the above</li> </ul>	nter requires
11)	How many minimum number of flip-flop binary counter? a) 32 b) c) 5 d)	s are required to make a MOD-28 16 4
12)	When two counters are cascaded, the the of their individual MOD numles) Product b) c) Log d	overall MOD number is equal to pers. Sum Reciprocal
13)	<ul> <li>Clock signals are used in sequential log</li> <li>a) To tell current time</li> <li>b) To tell how propagation delay</li> <li>c) To carry serial data signals</li> <li>d) To synchronize events in various p</li> </ul>	gic circuits arts of the system
14)	How many flip-flops are in the IC7495? a) 1 b) c) 3 d)	2 4

Set

## S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 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 diagrams.
- 4) Assume suitable data if necessary.

## Section – I

## Q.2 Answer any four.

Seat

No.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

## Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
  - 4) Figure of Merit (Speed Power Product)

## Section – II

## Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

12

16

12

# S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Saturday, 14-12-2019 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.

**DIGITAL TECHNIQUES** 

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams.
- 4) Assume suitable data if necessary.

## MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- Maximum MOD number for a 2-bit binary counter is \_\_\_\_\_. 1)
  - a) 4 b) 3
  - d) 16 c) 8
- 2) To serially shift a 5-bit of data into a shift register, there must be \_\_\_\_\_.

4 clock pulses

Two variable term

- 1 clock pulse a) b)
- 5 clock pulses 1 clock pulse for each 1 d) c)
- To operate correctly, starting a ring counter requires \_\_\_\_\_. 3)
  - a) presetting all the flip-flops
  - b) clearing all the flip-flops
  - c) presetting one flip-flop and clearing all the others
  - d) none of the above
- 4) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
  - a) 32 b) 16 4
  - c) 5 d)
- When two counters are cascaded, the overall MOD number is equal to 5) the of their individual MOD numbers.
  - a) Product Sum b) c) Log d) Reciprocal
- 6) Clock signals are used in sequential logic circuits \_\_\_\_\_.
  - a) To tell current time
  - b) To tell how propagation delay
  - c) To carry serial data signals
  - d) To synchronize events in various parts of the system
- How many flip-flops are in the IC7495? 7)
  - a) 1 2 b) c) 3 d) 4
- 8) In a four variable K-map eight adjacent cells give \_\_\_\_
  - a) Single variable term b)
  - c) Three variable term d) Four variable term



Set

Max. Marks: 70

Marks: 14
- Set | Q
- 9) In a 4 bit full adder how many half adders and OR gates are required?
  - a) 8 and 4
- b) 7 and 4
- c) 7 and 3 d) 8 and 3
- Consider the following statements for a multiplexer \_\_\_\_\_. 10)
  - selects one of the several inputs and steers it to the output i)
  - ii) routes the data from a single input to many outputs
  - converts parallel data into serial data iii)
  - is a combinational circuit iv)

Which of the above is correct for a Multiplexer?

- a) i, ii, iii i. iii. iv b)
- c) i, ii, iv ii, iii, iv d)
- 11) Consider the following statements.
  - ECL has least propagation delay i)
  - TTL has largest fan out ii)
  - CMOS has highest noise margin iii)
  - TTL has lowest power dissipation iv)
  - Which of the following are correct for above statements?
  - a) i&iii ii & iv b)
  - c) iii & iv d) i&ii
- 12) A JK flip flop can be converted to D flip flop by, \_\_\_\_\_.
  - a) Connecting both J and K terminals to D
  - b) Connecting J terminal to D and leaving K open
  - Connecting K terminal to D and leaving J open c)
  - d) Connecting J terminal to D and K terminal to D through an inverter
- How many NAND gates are used to construct Active High S-R flip flop? 13)
  - a) 5 b) 3 4
  - 8 c) d)
- In comparison with Serial adder the Parallel adder \_\_\_\_\_. 14)
  - a) is slower

- c) is faster
- b) has same speed
- d) has delayed output

### Seat No.

#### S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 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 diagrams.
- 4) Assume suitable data if necessary.

#### Section – I

#### Q.2 Answer any four.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

#### Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
  - 4) Figure of Merit (Speed Power Product)

#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

#### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

12

16

12

Seat	
No.	

#### S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 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.
- 4) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

1)

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

- A JK flip flop can be converted to D flip flop by, \_\_\_\_\_.
  - a) Connecting both J and K terminals to D
  - b) Connecting J terminal to D and leaving K open
  - c) Connecting K terminal to D and leaving J open
  - d) Connecting J terminal to D and K terminal to D through an inverter
- 2) How many NAND gates are used to construct Active High S-R flip flop?
  - a) 5 b) 3
  - c) 4 d) 8
- 3) In comparison with Serial adder the Parallel adder \_\_\_\_\_.
  - a) is slowerb) has same speedc) is fasterd) has delayed output
    - is faster d) has delayed output
- 4) Maximum MOD number for a 2-bit binary counter is \_\_\_\_\_.
  - a) 4 b) 3
  - c) 8 d) 16
- 5) To serially shift a 5-bit of data into a shift register, there must be \_\_\_\_\_.
  - a) 1 clock pulse b) 4 clock pulses
  - c) 5 clock pulses d) 1 clock pulse for each 1
- 6) To operate correctly, starting a ring counter requires \_\_\_\_\_.
  - a) presetting all the flip-flops
  - b) clearing all the flip-flops
  - c) presetting one flip-flop and clearing all the others
  - d) none of the above
- 7) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
  - a) 32 b) 16 c) 5 d) 4
- 8) When two counters are cascaded, the overall MOD number is equal to the \_\_\_\_\_ of their individual MOD numbers.
  - a) Product b) Sum
  - c) Log d) Reciprocal

Max. Marks: 70

Set

R

Marks: 14

9) Clock signals are used in sequential logic circuits \_\_\_\_\_.

- a) To tell current time
- b) To tell how propagation delay
- c) To carry serial data signals
- d) To synchronize events in various parts of the system

#### 10) How many flip-flops are in the IC7495?

- a) 1 b) 2
- c) 3 d) 4
- 11) In a four variable K-map eight adjacent cells give \_\_\_\_\_
  - a) Single variable term b) Two variable term
  - c) Three variable term d) Four variable term
- 12) In a 4 bit full adder how many half adders and OR gates are required?
  - a) 8 and 4 b) 7 and 4
  - c) 7 and 3 d) 8 and 3
- 13) Consider the following statements for a multiplexer \_\_\_\_
  - i) selects one of the several inputs and steers it to the output
  - ii) routes the data from a single input to many outputs
  - iii) converts parallel data into serial data
  - iv) is a combinational circuit

Which of the above is correct for a Multiplexer?

- a) i, ii, iii b) i, iii, iv
- c) i, ii, iv d) ii, iii, iv
- 14) Consider the following statements.
  - i) ECL has least propagation delay
  - ii) TTL has largest fan out
  - iii) CMOS has highest noise margin
  - iv) TTL has lowest power dissipation

Which of the following are correct for above statements?

- a) i & iii b) ii & iv
- c) iii & iv d) i & ii

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Set R

# S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Day & Date: Saturday, 14-12-2019 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 diagrams.
- 4) Assume suitable data if necessary.

#### Section – I

DIGITAL TECHNIQUES

#### Q.2 Answer any four.

Seat

No.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

#### Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
  - 4) Figure of Merit (Speed Power Product)

#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

#### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

R

12

16

12

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering DIGITAL TECHNIQUES** 

Day & Date: Saturday, 14-12-2019 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.
- 4) Assume suitable 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

- To operate correctly, starting a ring counter requires \_\_\_\_\_. 1)
  - a) presetting all the flip-flops
  - b) clearing all the flip-flops
  - c) presetting one flip-flop and clearing all the others
  - d) none of the above
- 2) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
  - a) 32 16 b) d) c) 5 4
- 3) When two counters are cascaded, the overall MOD number is equal to the \_\_\_\_\_ of their individual MOD numbers.
  - a) Product b) Sum
  - d) Reciprocal c) Log
- Clock signals are used in sequential logic circuits \_\_\_\_\_. 4)
  - a) To tell current time
  - b) To tell how propagation delay
  - c) To carry serial data signals
  - d) To synchronize events in various parts of the system
- 5) How many flip-flops are in the IC7495?
  - a) 1 2 b)
  - c) 3 d) 4
- 6) In a four variable K-map eight adjacent cells give \_\_\_\_\_.
  - a) Single variable term b)
  - c) Three variable term
- In a 4 bit full adder how many half adders and OR gates are required? 7)
  - a) 8 and 4 7 and 4 b)
  - c) 7 and 3 d) 8 and 3

Max. Marks: 70

Marks: 14

- - Two variable term
  - d) Four variable term

#### Set 8) Consider the following statements for a multiplexer selects one of the several inputs and steers it to the output i) routes the data from a single input to many outputs ii) converts parallel data into serial data iii) is a combinational circuit iv) Which of the above is correct for a Multiplexer? a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii. iii. iv 9) Consider the following statements. ECL has least propagation delay i) ii) TTL has largest fan out CMOS has highest noise margin iii) TTL has lowest power dissipation iv) Which of the following are correct for above statements? a) i&iii b) ii & iv c) iii & iv d) i&ii A JK flip flop can be converted to D flip flop by, \_\_\_\_\_. 10) a) Connecting both J and K terminals to D b) Connecting J terminal to D and leaving K open c) Connecting K terminal to D and leaving J open d) Connecting J terminal to D and K terminal to D through an inverter How many NAND gates are used to construct Active High S-R flip flop? 11) a) 5 b) 3 c) 4 d) 8 In comparison with Serial adder the Parallel adder \_\_\_\_\_. 12) a) is slower b) has same speed c) is faster d) has delayed output 13) Maximum MOD number for a 2-bit binary counter is \_\_\_\_\_. a) 4 b) 3 c) 8 d) 16 To serially shift a 5-bit of data into a shift register, there must be \_\_\_\_\_. 14)

- 1 clock pulse a)
  - 5 clock pulses c)
- 4 clock pulses b) d) 1 clock pulse for each 1

**SLR-FM-678** 

### Seat No.

#### S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL TECHNIQUES

Day & Date: Saturday, 14-12-2019 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 diagrams.
- 4) Assume suitable data if necessary.

#### Section – I

#### Q.2 Answer any four.

- a) Implement the following Boolean function F, using NOR logic  $F(A, B, C, D) = \sum (0, 4, 8, 9, 10, 11, 12, 14)$
- Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.</li>
- c) Design an Odd Parity Generator for 3 bit binary input.
- d) Design and explain 2 input NAND gate using CMOS.
- e) Explain 1-bit latch using NAND logic.

#### Q.3 Solve any two.

- a) Simplify the following functions, and implement using NAND gate F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'
- **b)** Explain General model for flip-flop conversion and convert D-flip flop to T flip-flop.
- c) Define and explain following characteristics of a logic family
   1) Fan-out
  - 2) Propagation Delay
  - 3) Power Dissipation
  - 4) Figure of Merit (Speed Power Product)

#### Section – II

#### Q.4 Attempt any four.

- a) Explain in detail SIPO Shift register with example & waveform.
- **b)** Design 2 bit synchronous down counter using T Flip flop.
- c) Write VHDL code for Comparator.
- d) Explain Mealy machine with block diagram & example.
- e) Design a PROM PLD based 3 bit binary to gray converter.

#### Q.5 Attempt any two.

- a) Explain in detail ring counter & twisted ring counter with waveform.
- **b)** Write a short note on IC 7490. Design MOD 7 counter using IC 7490.
- c) Explain sequence detector with example.

Max. Marks: 56

12

16

12

Seat	
No.	

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 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 Page No.3

2) Figures to the right indicate full marks.

### MCQ/Objective Type Questions

#### Q.1 Choose the correct alternatives from the options.

- A linked list type that navigates for an item in forward manner only, is 1) called b) Linear Linked List
  - a) Simple Linked List
  - c) Doubly Linked List d) Circular linked List
- 2) A sequence of data structures connected together through links are known to be
  - a) Connected list b)
  - Traversed link d) Compound List C)
- Which if the following is/are the levels of implementation of data structure \_\_\_\_\_. 3)
  - a) Abstract level Application level b)
  - Implementation level All of the above c) d)
- A binary search tree whose left sub tree and right sub tree differ in height 4) by at most 1 unit is called \_\_\_\_\_.
  - a) AVL tree b)
  - c) Lemma tree
- level is where the model becomes compatible executable code. 5)
  - a) Abstract level
  - c) Implementation level
- Stack is also called as \_\_\_\_\_. 6)
  - a) Last in first out
  - c) Last in last out
- is not the component of data structure. 7)
  - a) Operations Storage Structures b)
  - c) Algorithms None of above d)
- \_ is very useful in situation when data have to stored and then 8) retrieved in reverse order.
  - a) Stack b) Queue
  - c) List d) Link list
- Which data structure allows deleting data elements from and inserting at 9) rear? Queues
  - a) Stacks b) c) Dequeues d)

Max. Marks: 70

Set

Marks: 14

14

Linked list

- Red-black tree
- d) None of the above
- Application level b)
- All of the above d)
  - b) First in last out
  - d) First in first out

Binary search tree

10) Which of the following is non-liner data structure?

- a) Stacks b) List
- c) Strings d) Trees
- 11) Which of the following data structure is linear type?
  - a) Graph b) Trees
  - c) Binary tree d) Stack
- 12) Identify the data structure which allows deletions at both ends of the list but insertion at only one end.
  - a) Input restricted dequeue
- b) Output restricted dequeue

**SLR-FM-679** 

Set P

- c) Priority queues
- d) Stack
- 13) Which data structure is used in breadth first search of a graph to hold nodes?
  - a) Stack b) Queue
  - c) Tree d) Array
- 14) A directed graph is \_\_\_\_\_ if there is a path from each vertex to every other vertex in the digraph.
  - a) Weakly connected
- b) Strongly Connected
- c) Tightly Connected
- d) Linearly Connected

Seat	
No.	

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### SECTION I

#### Q.2 Attempt any three.

- a) Define queue & explain its operations.
- b) Draw and explain the structure of simple link list.
- c) Write a program for Fibonacci series using recursion.
- d) Differentiate between Stack and Queue.
- e) Define Infix, Prefix & Postfix with example.

#### Q.3 Attempt any two.

- a) Write a program for factorial using recursion & explain the operations of Stack.
- b) List & Explain different operation of Circular link List.
- c) Explain DEQUE & Priority Queue.

#### **SECTION II**

#### Q.4 Attempt any three.

- a) Define sibling, root, leaf node, Parent node.
- **b)** Explain open addressing and closed addressing collision resolving techniques.
- c) Define Hashing, Hash function, Collision.
- d) Write the time complexity of Insertion sort, Bubble sort, Selection sort, Merge sort.

#### Q.5 Attempt any two.

- a) Explain Quick sort with example.
- **b)** Write a program for linear search & explain.
- c) Explain DFS & BFS traverse with example.



Max. Marks: 56

12

12

16

# S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 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 Page No.3

2) Figures to the right indicate full marks.

#### MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options.

- is very useful in situation when data have to stored and then 1) retrieved in reverse order.
  - a) Stack b) Queue Link list c) List d)
- 2) Which data structure allows deleting data elements from and inserting at rear?
  - a) Stacks b) Queues c) Dequeues d) Binary search tree
- 3) Which of the following is non-liner data structure?
  - Stacks List a) b)
  - c) Strings d) Trees
- 4) Which of the following data structure is linear type?
  - a) Graph Trees b) c) Binary tree d) Stack
- Identify the data structure which allows deletions at both ends of the list 5) but insertion at only one end.

Output restricted dequeue

Linearly Connected

Stack

Queue

Array

- Input restricted dequeue b) a) d)
- c) Priority queues

**Tightly Connected** 

C)

- Which data structure is used in breadth first search of a graph to hold 6) nodes?
  - Stack a) b) Tree d) C)
- 7) A directed graph is \_\_\_\_\_ if there is a path from each vertex to every
- other vertex in the digraph. Weakly connected a) b) Strongly Connected
- 8) A linked list type that navigates for an item in forward manner only, is called

d)

- a) Simple Linked List Linear Linked List b)
- c) Doubly Linked List Circular linked List d)

Marks: 14

14

Set Q

Max. Marks: 70

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No.

- A sequence of data structures connected together through links are known to be \_\_\_\_\_.
  - a) Connected list
  - c) Traversed link
- b) Linked listd) Compound List
- 10) Which if the following is/are the levels of implementation of data structure \_\_\_\_\_.
  - a) Abstract level b) Application level
  - c) Implementation level
- d) All of the above
- 11) A binary search tree whose left sub tree and right sub tree differ in height by at most 1 unit is called \_\_\_\_\_.
  - a) AVL tree
- b) Red-black tree
- c) Lemma tree d) None of the above
- 12) \_\_\_\_\_ level is where the model becomes compatible executable code.
  - a) Abstract level
  - c) Implementation level
- b) Application leveld) All of the above
- 13) Stack is also called as \_\_\_\_\_.
  - a) Last in first outc) Last in last out
- b) First in last outd) First in first out
- 14) \_\_\_\_\_ is not the component of data structure.
  - a) Operations
  - c) Algorithms

- b) Storage Structures
- d) None of above



Seat	
No.	

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### SECTION I

#### Q.2 Attempt any three.

- a) Define queue & explain its operations.
- b) Draw and explain the structure of simple link list.
- c) Write a program for Fibonacci series using recursion.
- d) Differentiate between Stack and Queue.
- e) Define Infix, Prefix & Postfix with example.

#### Q.3 Attempt any two.

- a) Write a program for factorial using recursion & explain the operations of Stack.
- b) List & Explain different operation of Circular link List.
- c) Explain DEQUE & Priority Queue.

#### **SECTION II**

#### Q.4 Attempt any three.

- a) Define sibling, root, leaf node, Parent node.
- **b)** Explain open addressing and closed addressing collision resolving techniques.
- c) Define Hashing, Hash function, Collision.
- d) Write the time complexity of Insertion sort, Bubble sort, Selection sort, Merge sort.

#### Q.5 Attempt any two.

- a) Explain Quick sort with example.
- **b)** Write a program for linear search & explain.
- c) Explain DFS & BFS traverse with example.



Max. Marks: 56

16

12

12

#### Book Page No.3 2) Figures to the right indicate full marks. MCQ/Objective Type Questions **Duration: 30 Minutes** Choose the correct alternatives from the options. level is where the model becomes compatible executable code. a) Abstract level b) Application level All of the above c) Implementation level d) Stack is also called as \_\_\_\_\_ a) Last in first out First in last out b) c) Last in last out d) First in first out \_ is not the component of data structure.

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

Q.1

1)

2)

3)

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

#### **Storage Structures** a) Operations b) c) Algorithms d) None of above

#### is very useful in situation when data have to stored and then 4) retrieved in reverse order.

- a) Stack b) Queue
- d) Link list c) List
- Which data structure allows deleting data elements from and inserting at 5) rear? a) Stacks
- Which of the following is non-liner data structure? 6)
  - a) Stacks b) List
  - c) Strings d) Trees

Which of the following data structure is linear type? 7)

- a) Graph b) Trees c) Binary tree d) Stack
- Identify the data structure which allows deletions at both ends of the list 8) but insertion at only one end.
  - a) Input restricted dequeue c) Priority queues

c) Dequeues

- Which data structure is used in breadth first search of a graph to hold 9) nodes? b) Queue
  - Stack a)
  - C) Tree d)

**SLR-FM-679** 



Max. Marks: 70

R

Set

Marks: 14

14

- b) Queues
- d) Binary search tree

- b)
- d) Stack

Array

Output restricted dequeue

- 10) A directed graph is \_\_\_\_\_ if there is a path from each vertex to every other vertex in the digraph.
  - a) Weakly connected
- b) Strongly Connected

Set R

- c) Tightly Connected d) Linearly Connected
- 11) A linked list type that navigates for an item in forward manner only, is called \_\_\_\_\_.
  - a) Simple Linked List b) Linear Linked List
  - c) Doubly Linked List d) Circular linked List
- 12) A sequence of data structures connected together through links are known to be \_\_\_\_\_.
  - a) Connected list b
  - c) Traversed link
- b) Linked list
- d) Compound List
- 13) Which if the following is/are the levels of implementation of data structure \_\_\_\_\_.
  - a) Abstract level b) Application level
  - c) Implementation level d) All of the above
- 14) A binary search tree whose left sub tree and right sub tree differ in height by at most 1 unit is called \_\_\_\_\_.
  - a) AVL tree
  - c) Lemma tree

- b) Red-black tree
- d) None of the above

Max. Marks: 56

12

16

12

16

Seat	
No.	

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### SECTION I

#### Q.2 Attempt any three.

- a) Define queue & explain its operations.
- b) Draw and explain the structure of simple link list.
- c) Write a program for Fibonacci series using recursion.
- d) Differentiate between Stack and Queue.
- e) Define Infix, Prefix & Postfix with example.

#### Q.3 Attempt any two.

- a) Write a program for factorial using recursion & explain the operations of Stack.
- b) List & Explain different operation of Circular link List.
- c) Explain DEQUE & Priority Queue.

#### **SECTION II**

#### Q.4 Attempt any three.

- a) Define sibling, root, leaf node, Parent node.
- **b)** Explain open addressing and closed addressing collision resolving techniques.
- c) Define Hashing, Hash function, Collision.
- d) Write the time complexity of Insertion sort, Bubble sort, Selection sort, Merge sort.

#### Q.5 Attempt any two.

- a) Explain Quick sort with example.
- **b)** Write a program for linear search & explain.
- c) Explain DFS & BFS traverse with example.

а) С)	Binary tree	d)	Stack
lde but	ntify the data structure which allow insertion at only one end.	ws de	letions at both ends of the list
a) c)	Input restricted dequeue Priority queues	b) d)	Output restricted dequeue Stack
Wh noc	ich data structure is used in bread	dth fir	st search of a graph to hold
a) c)	Stack Tree	b) d)	Queue Array
A d oth	irected graph is if there is a error of the term of the term is the digraph.	a path	from each vertex to every
a) c)	Weakly connected Tightly Connected	b) d)	Strongly Connected Linearly Connected
A lii call	nked list type that navigates for a ed	n item	in forward manner only, is
a) c)	Simple Linked List Doubly Linked List	b) d)	Linear Linked List Circular linked List
A s kno	equence of data structures conne	ected	ogether through links are
a) c)	Connected list Traversed link	b) d)	Linked list Compound List
Wh a) c)	ich if the following is/are the level Abstract level Implementation level	s of ir b) d)	nplementation of data structure _ Application level All of the above
A b by a	inary search tree whose left sub t at most 1 unit is called	ree a	nd right sub tree differ in height
a) c)	AVL tree Lemma tree	b) d)	Red-black tree None of the above
			De

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DATA STRUCTURES USING 'C'

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 Page No.3

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 is non-liner data structure? 1)
  - a) Stacks List b) d) c) Strings Trees
- Which of the following data structure is linear type? 2)
  - a) Granh h) Troos
- 3)

**SLR-FM-679** 



Max. Marks: 70

Seat No.

4)

5)

6)

7)

8)

9)

Marks: 14

10) level is where the model becomes compatible executable code.

a) Abstract level

**Application level** b)

**SLR-FM-679** 

Set S

- c) Implementation level
- All of the above d)
- Stack is also called as \_\_\_\_\_. 11)
- a) Last in first out b) First in last out
- c) Last in last out First in first out d)
- 12) \_ is not the component of data structure.
  - a) Operations Storage Structures b)
  - c) Algorithms d) None of above
- is very useful in situation when data have to stored and then 13) retrieved in reverse order.
  - a) Stack b) Queue
  - c) List Link list d)
- 14) Which data structure allows deleting data elements from and inserting at rear?
  - a) Stacks
  - Queues b) c) Dequeues d) Binary search tree

Seat	
No.	

#### S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### SECTION I

#### Q.2 Attempt any three.

- a) Define queue & explain its operations.
- b) Draw and explain the structure of simple link list.
- c) Write a program for Fibonacci series using recursion.
- d) Differentiate between Stack and Queue.
- e) Define Infix, Prefix & Postfix with example.

#### Q.3 Attempt any two.

- a) Write a program for factorial using recursion & explain the operations of Stack.
- b) List & Explain different operation of Circular link List.
- c) Explain DEQUE & Priority Queue.

#### **SECTION II**

#### Q.4 Attempt any three.

- a) Define sibling, root, leaf node, Parent node.
- **b)** Explain open addressing and closed addressing collision resolving techniques.
- c) Define Hashing, Hash function, Collision.
- d) Write the time complexity of Insertion sort, Bubble sort, Selection sort, Merge sort.

#### Q.5 Attempt any two.

- a) Explain Quick sort with example.
- **b)** Write a program for linear search & explain.
- c) Explain DFS & BFS traverse with example.



Max. Marks: 56

16

12

12

Seat No.			Set	Ρ			
S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering							
Day 8	L Date	te: Friday, 22-11-2019	Max. Marks	s: 70			
Instri	Ictio	<b>ons:</b> 1) Question 1 is compulsory: it should be si	solved in first 30 minutes in				
		<ul> <li>Answer book.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Assume suitable data if necessary.</li> <li>4) Use of electronic component datasheet in the second seco</li></ul>	is allowed.				
		MCQ/Objective Type Ques	stions				
Durat	ion: 3	30 Minutes	Marks	s: 14			
Q.1	<b>Cho</b> (1)	A direct coupled amplifier is also called as         a)       RC coupled amplifier         b)       DC         c)       AC amplifier         d)       NC	 C amplifier one of these	14			
	2)	Darlington pair consists of two cascada)CB,CBb)CEc)CC,CCd)CE	ded. E,CE E,CC				
	3)	<ul> <li>Wien bridge consists of as feedback</li> <li>a) Three resistor &amp; capacitor network</li> <li>b) Two resistor &amp; capacitor network</li> <li>c) Lead Lag network made up of R&amp;C</li> <li>d) Inductor and Capacitor network</li> </ul>	t network.				
	4)	<ul> <li>Cascading of amplifier results in</li> <li>a) Increasing gain and Bandwidth</li> <li>b) Decreasing gain and bandwidth</li> <li>c) Increasing gain and decrease in bandwid</li> <li>d) No effect on gain and bandwidth</li> </ul>	dth				
	5)	A transconductance amplifier has inpu output resistance. a) Zero, Infinity b) Ze c) Infinity, Zero d) Inf	ut resistance and ero, Zero finity, Infinity				
	6)	Crystal oscillators are preferred because a) It works at very high frequency b) It p c) It produces high output swing d) No	 produces stable oscillation one of these				
	7)	<ul> <li>The oscillation in LC circuit is produced due to</li> <li>a) Transfer of energy between L &amp; C</li> <li>b) Transfer of energy between R &amp; C</li> <li>c) Both a &amp; b</li> <li>d) None of these</li> </ul>	)				

Set P

- 8) Pre regulator circuit is \_\_\_\_\_.
  - a) Constant voltage source
  - b) Constant current source
  - c) Stability factor improvement circuit
  - d) Both b & c
- 9) The instantaneous voltage at the input of IC regulator must always \_\_\_\_\_.
  - a) Exceed the output voltage
  - b) Lower than the DC output voltage
  - c) Equal to the DC output voltage
  - d) None of these
- 10) For IC regulators input capacitor is required for \_\_\_\_\_.
  - a) Short circuit protection
  - b) Improve transient response
  - c) Over voltage protection
  - d) Reducing unwanted oscillations in input
- 11) Schmitt trigger is \_\_\_\_\_.
  - a) Amplifier b) Rectifier
  - c) Oscillator d) All of these
- 12) Power dissipated in case of astable multivibrator is due to \_\_\_\_\_.
  - a) Vcc b) Vcc, Rc
  - c) Rc d) None

A sine wave can be converted into square wave using \_\_\_\_\_

- Astable multivibrator b) Monostable multivibrator
- c) Rectifier d) Schmitt trigger
- 14) IC 555 can act as divide by n network in \_\_\_\_\_ mode.
  - a) Astable

a)

b) Monostable

c) Bostable

d) All of these

Set F

#### S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – II

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

#### Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### Section - I

#### Q.2 Solve any four:

Seat

No.

- a) Derive expression for mid frequency voltage gain of two stage RC coupled amplifier.
- **b)** What is transformer coupled amplifier class A power amplifier and derive its efficiency.
- c) Explain working of crystal oscillator.
- d) An amplifier has a midband gain of 1500 and a bandwidth of 4MHz, the midband gain reduces to 150 when a negative feedback is applied. Determine value of feedback factor and the bandwidth. (0.006,40MHz).
- e) Compare voltage series, current series, voltage shunt, current shunt feedback amplifier.

#### Q.3 Solve any two:

- a) State Barkhausen's criteria for oscillation and derive expression for frequency of oscillation for Wien bridge oscillator.
- **b)** Design voltage series feedback amplifier to provide voltage gain of 100, use supply voltage of 12V.
- c) Explain frequency response of transformer coupled amplifier.

#### Section - II

#### Q.4 Solve any four:

- a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use  $Iadj=100\mu A$ .
- **b)** Explain working of transistorized series voltage regulator.
- c) Explain working of Schmitt trigger using IC 555.
- d) Design a timer using IC 555 to turn OFF LED for 2 minute when trigger pulse is given to IC 555, Initially LED is in ON condition.
- e) Derive frequency of oscillation for astable multivibrator using transistor.

#### Q.5 Solve any two:

- a) Design a timer which repeatedly turning ON & OFF as follows.
  - i) ON time variation = 1.5 msec to 3.5 msec
  - ii) OFF time variation = 1 msec to 2 msec.
- **b)** Design a transistorized series voltage regulator for 12V, 1A when input voltage given is 16V.
- c) Explain ratings of IC regulators in detail and Design a dual regulated power supply using 317 & 337 to provide +- 12V to +- 25V.

Max. Marks: 56

12

16

16

12

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

Seat No.	:							Set	Q
	S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering								
		ELECT	RON		JIT AN	IAL	SIS AND DESIGN - II		
Day & Time:	& Date : 02:3	e: Friday, 22 0 PM To 05	2-11-2 5:30 PI	:019 M			Max	. Marks	: 70
Instru	uctio	<b>ns:</b> 1) Ques Ansv	stion 1 ver boo	is compuls ok	ory; it s	hould	d be solved in first 30 minutes	in	
		2) Figur 3) Assu 4) Use	res to t ime su of elec	the right inc iitable data stronic com	licate fu if neces ponent	ıll ma ssary datas	arks. 7. sheet is allowed.		
				MCQ/Obj	ective 1	Гуре	Questions		
Durat	ion: 3	30 Minutes						Marks	;: 14
Q.1	Cho 1	ose the col	rrect o	option					14
	1)	<ul> <li>a) Const</li> <li>b) Const</li> <li>c) Stabil</li> <li>d) Both I</li> </ul>	tor circ tant vo tant cu lity fact b & c	uit is oltage sourc irrent sourc tor improve	 e ment ci	rcuit			
	2)	The instan a) Excee b) Lowe c) Equal d) None	taneou ed the r than I to the of the	us voltage a output volta the DC out DC output se	at the in age put volta voltage	put o age e	f IC regulator must always		
	3)	For IC regulation a) Short b) Impro c) Over d) Redu	ulators circuit ove trai voltage cing ui	input capa protection nsient respo e protectior nwanted os	citor is onse n cillation	requi ns in i	ired for		
	4)	Schmitt trig a) Ampli c) Oscill	gger is ifier ator			b) d)	Rectifier All of these		
	5)	Power diss a) Vcc c) Rc	sipated	l in case of	astable	e mult b) d)	tivibrator is due to Vcc, Rc None		
	6)	A sine way a) Astab c) Rectif	ve can ble mul fier	be converte tivibrator	ed into :	squa b) d)	re wave using Monostable multivibrator Schmitt trigger		
	7)	IC 555 can a) Astab c) Bosta	n act as ble ible	s divide by	n netwo	ork in b) d)	mode. Monostable All of these		
	8)	A direct co a) RC co c) AC ar	upled oupled mplifier	amplifier is amplifier r	also ca	lled a b) d)	as DC amplifier None of these		

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SLR-FM-680 Set Q

- 9) Darlington pair consists of two \_\_\_\_\_ cascaded.
  - a) CB,CB b) CE,CE
  - c) CC,CC d) CE,CC
- 10) Wien bridge consists of \_\_\_\_\_ as feedback network.
  - a) Three resistor & capacitor network
  - b) Two resistor & capacitor network
  - c) Lead Lag network made up of R&C
  - d) Inductor and Capacitor network
- 11) Cascading of amplifier results in \_
  - a) Increasing gain and Bandwidth
  - b) Decreasing gain and bandwidth
  - c) Increasing gain and decrease in bandwidth
  - d) No effect on gain and bandwidth
- 12) A transconductance amplifier has \_\_\_\_\_ input resistance and \_\_\_\_\_ output resistance.
  - a) Zero, Infinity b) Zero, Zero
  - c) Infinity, Zero d) Infinity, Infinity
- 13) Crystal oscillators are preferred because \_\_\_\_
  - a) It works at very high frequency b) It produces stable oscillation
  - c) It produces high output swing d) None of these
- 14) The oscillation in LC circuit is produced due to \_\_\_\_\_.
  - a) Transfer of energy between L & C
  - b) Transfer of energy between R & C
  - c) Both a & b
  - d) None of these

Set Q

#### S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – II

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

Seat

No.

#### Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### Section – I

#### Q.2 Solve any four:

- a) Derive expression for mid frequency voltage gain of two stage RC coupled amplifier.
- **b)** What is transformer coupled amplifier class A power amplifier and derive its efficiency.
- c) Explain working of crystal oscillator.
- d) An amplifier has a midband gain of 1500 and a bandwidth of 4MHz, the midband gain reduces to 150 when a negative feedback is applied. Determine value of feedback factor and the bandwidth. (0.006,40MHz).
- e) Compare voltage series, current series, voltage shunt, current shunt feedback amplifier.

#### Q.3 Solve any two:

- a) State Barkhausen's criteria for oscillation and derive expression for frequency of oscillation for Wien bridge oscillator.
- **b)** Design voltage series feedback amplifier to provide voltage gain of 100, use supply voltage of 12V.
- c) Explain frequency response of transformer coupled amplifier.

#### Section – II

### Q.4 Solve any four:

- a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use  $Iadj=100\mu A$ .
- **b)** Explain working of transistorized series voltage regulator.
- c) Explain working of Schmitt trigger using IC 555.
- d) Design a timer using IC 555 to turn OFF LED for 2 minute when trigger pulse is given to IC 555, Initially LED is in ON condition.
- e) Derive frequency of oscillation for astable multivibrator using transistor.

#### Q.5 Solve any two:

- a) Design a timer which repeatedly turning ON & OFF as follows.
  - i) ON time variation = 1.5 msec to 3.5 msec
  - ii) OFF time variation = 1 msec to 2 msec.
- **b)** Design a transistorized series voltage regulator for 12V, 1A when input voltage given is 16V.
- c) Explain ratings of IC regulators in detail and Design a dual regulated power supply using 317 & 337 to provide +- 12V to +- 25V.

Max. Marks: 56

16

12

12

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Seat No.								Set	R
S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – II									. 70
Day & Time:	02:3	e: Fri 80 PN	day, 22-11- 1 To 05:30 F	2019 PM			Ma	x. Marks	5:70
Instru	ıctio	ns: 1 2 3 4	) Question Answer bo ) Figures to 3) Assume s 4) Use of ele	1 is compulsory; it ook. the right indicate t uitable data if nece ctronic componen	should full ma essary t datas	d k ark ′. sh	be solved in first 30 minute s. eet is allowed.	s in	
				MCQ/Objective	Туре	Q	uestions		
Durati	ion: 3	30 IVII	nutes					Marks	s: 14
Q.1	<b>Cho</b> 1)	A tra outp a) c)	ansconducta out resistanc Zero, Infini Infinity, Zel	ance amplifier has e. ty ro	b) d)		input resistance and Zero, Zero Infinity, Infinity		14
	2)	Crys a) c)	stal oscillato It works at It produces	rs are preferred be very high frequence high output swing	ecause cy b) g d)	9 _	It produces stable oscillat None of these	tion	
	3)	The a) b) c) d)	oscillation Transfer of Transfer of Both a & b None of the	in LC circuit is prov energy between I energy between F ese	duced _ & C R & C	dı	ue to		
	4)	Pre a) b) c) d)	regulator ci Constant v Constant c Stability fac Both b & c	rcuit is oltage source urrent source ctor improvement o	circuit				
ł	5)	The a) b) c) d)	e instantaned Exceed the Lower than Equal to th None of the	ous voltage at the e output voltage n the DC output vo e DC output voltage ese	input o Itage ge	of	IC regulator must always _		
(	6)	For a) b) c) d)	IC regulator Short circu Improve tra Over voltag Reducing u	s input capacitor is it protection ansient response ge protection unwanted oscillatio	s requi ons in i	ire inp	d for		
	7)	Schi a) c)	mitt trigger i Amplifier Oscillator	S	b) d)	R A	ectifier Il of these		

Set R

**SLR-FM-680** 

- Power dissipated in case of astable multivibrator is due to \_\_\_\_\_. 8) b)
  - a) Vcc c)

- Vcc, Rc
- Rc d) None

9) A sine wave can be converted into square wave using \_\_\_\_

- a) Astable multivibrator b) C) Rectifier
  - Monostable multivibrator d) Schmitt trigger

IC 555 can act as divide by n network in \_\_\_\_\_ mode. 10)

- Astable Monostable a) b) Bostable C)
  - d) All of these

A direct coupled amplifier is also called as \_ 11)

- RC coupled amplifier b) DC amplifier a)
- AC amplifier d) None of these C)
- 12) Darlington pair consists of two \_ cascaded.
  - CB,CB b) CE,CE a)
  - **CC,CC** d) CE.CC C)
- 13) Wien bridge consists of \_\_\_\_\_ as feedback network.
  - Three resistor & capacitor network a)
  - Two resistor & capacitor network b)
  - Lead Lag network made up of R&C c)
  - Inductor and Capacitor network d)
- 14) Cascading of amplifier results in
  - Increasing gain and Bandwidth a)
  - Decreasing gain and bandwidth b)
  - Increasing gain and decrease in bandwidth C)
  - No effect on gain and bandwidth d)

# Set F

#### Page **9** of **12**

#### S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – II

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

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### Section – I

#### Q.2 Solve any four:

- a) Derive expression for mid frequency voltage gain of two stage RC coupled amplifier.
- **b)** What is transformer coupled amplifier class A power amplifier and derive its efficiency.
- c) Explain working of crystal oscillator.
- d) An amplifier has a midband gain of 1500 and a bandwidth of 4MHz, the midband gain reduces to 150 when a negative feedback is applied. Determine value of feedback factor and the bandwidth. (0.006,40MHz).
- e) Compare voltage series, current series, voltage shunt, current shunt feedback amplifier.

#### Q.3 Solve any two:

- a) State Barkhausen's criteria for oscillation and derive expression for frequency of oscillation for Wien bridge oscillator.
- **b)** Design voltage series feedback amplifier to provide voltage gain of 100, use supply voltage of 12V.
- c) Explain frequency response of transformer coupled amplifier.

#### Section – II

### Q.4 Solve any four:

- a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use  $Iadj=100\mu A$ .
- **b)** Explain working of transistorized series voltage regulator.
- c) Explain working of Schmitt trigger using IC 555.
- d) Design a timer using IC 555 to turn OFF LED for 2 minute when trigger pulse is given to IC 555, Initially LED is in ON condition.
- e) Derive frequency of oscillation for astable multivibrator using transistor.

### Q.5 Solve any two:

- a) Design a timer which repeatedly turning ON & OFF as follows.
  - i) ON time variation = 1.5 msec to 3.5 msec
  - ii) OFF time variation = 1 msec to 2 msec.
- **b)** Design a transistorized series voltage regulator for 12V, 1A when input voltage given is 16V.
- c) Explain ratings of IC regulators in detail and Design a dual regulated power supply using 317 & 337 to provide +- 12V to +- 25V.

Max. Marks: 56

16

12

12

Sea No.	t					Set	S
		S.E. (Part - I	I) (Old) (CGPA)	Exar	nination Nov/Dec-20	19	
		Electror	NIC CIPCUIT AN	nuni	cation Engineering		
Day of Time	& Dat	e: Friday, 22-11	-2019 PM		SIS AND DESIGN -	Max. Marks	: 70
Instr	uctio	<b>ns:</b> 1) Question	1 is compulsory; it s	should	be solved in first 30 min	utes in	
		Answer b 2) Figures to 3) Assume s	ook Page no.3 each o the right indicate f suitable data if nece	n ques ull ma ssary	stion carries 1 mark. rks.		
		4) Use of el	MCQ/Objective	datas Tvne	Questions		
Dura	tion: 3	30 Minutes		1900	Quoonono	Marks	: 14
Q.1	<b>Cho</b> 1)	ose the correct For IC regulato a) Short circu b) Improve tr c) Over volta d) Reducing	option rs input capacitor is uit protection ansient response ge protection unwanted oscillation	requi ns in i	red for		14
	2)	Schmitt trigger a) Amplifier c) Oscillator	is	b) d)	Rectifier All of these		
	3)	Power dissipate a) Vcc c) Rc	ed in case of astable	e mult b) d)	ivibrator is due to Vcc, Rc None		
	4)	A sine wave ca a) Astable m c) Rectifier	n be converted into ultivibrator	squai b) d)	re wave using Monostable multivibrator Schmitt trigger		
	5)	IC 555 can act a) Astable c) Bostable	as divide by n netw	ork in b) d)	mode. Monostable All of these		
	6)	A direct couple a) RC couple c) AC amplifi	d amplifier is also ca d amplifier er	alled a b) d)	as DC amplifier None of these		
	7)	Darlington pair a) CB,CB c) CC,CC	consists of two	c b) d)	ascaded. CE,CE CE,CC		
	8)	<ul><li>Wien bridge co</li><li>a) Three resi</li><li>b) Two resist</li><li>c) Lead Lag</li><li>d) Inductor a</li></ul>	nsists of a stor & capacitor net or & capacitor netw network made up of nd Capacitor netwo	s feed work ork f R&C rk	back network.		

Cascading of amplifier results in \_\_\_\_\_

- Increasing gain and Bandwidth a)
- Decreasing gain and bandwidth b)
- Increasing gain and decrease in bandwidth c)
- No effect on gain and bandwidth d)
- 10) A transconductance amplifier has \_\_\_\_\_ input resistance and \_\_\_\_\_ output resistance.
  - a) Zero, Infinity b) Zero, Zero
  - C) Infinity, Zero d) Infinity, Infinity
- 11) Crystal oscillators are preferred because \_\_\_\_
  - It works at very high frequency b) a)
  - It produces high output swing C)
- It produces stable oscillation

**SLR-FM-680** 

Set

- None of these d)
- 12) The oscillation in LC circuit is produced due to .
  - Transfer of energy between L & C a)
  - b) Transfer of energy between R & C
  - c) Both a & b

9)

- d) None of these
- 13) Pre regulator circuit is \_
  - a) Constant voltage source
  - b) Constant current source
  - Stability factor improvement circuit C)
  - d) Both b & c
- 14) The instantaneous voltage at the input of IC regulator must always \_\_\_\_\_.
  - a) Exceed the output voltage
  - b) Lower than the DC output voltage
  - c) Equal to the DC output voltage
  - d) None of these

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

# SLR-FM-680

Set S

### S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – II

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

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.
- 4) Use of electronic component datasheet is allowed.

#### Section – I

#### Q.2 Solve any four:

- a) Derive expression for mid frequency voltage gain of two stage RC coupled amplifier.
- **b)** What is transformer coupled amplifier class A power amplifier and derive its efficiency.
- c) Explain working of crystal oscillator.
- d) An amplifier has a midband gain of 1500 and a bandwidth of 4MHz, the midband gain reduces to 150 when a negative feedback is applied. Determine value of feedback factor and the bandwidth. (0.006,40MHz).
- e) Compare voltage series, current series, voltage shunt, current shunt feedback amplifier.

#### Q.3 Solve any two:

- a) State Barkhausen's criteria for oscillation and derive expression for frequency of oscillation for Wien bridge oscillator.
- **b)** Design voltage series feedback amplifier to provide voltage gain of 100, use supply voltage of 12V.
- c) Explain frequency response of transformer coupled amplifier.

### Section – II

### Q.4 Solve any four:

- **a)** Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use ladj=100μA.
- **b)** Explain working of transistorized series voltage regulator.
- c) Explain working of Schmitt trigger using IC 555.
- d) Design a timer using IC 555 to turn OFF LED for 2 minute when trigger pulse is given to IC 555, Initially LED is in ON condition.
- e) Derive frequency of oscillation for astable multivibrator using transistor.

### Q.5 Solve any two:

- a) Design a timer which repeatedly turning ON & OFF as follows.
  - i) ON time variation = 1.5 msec to 3.5 msec
  - ii) OFF time variation = 1 msec to 2 msec.
- **b)** Design a transistorized series voltage regulator for 12V, 1A when input voltage given is 16V.
- c) Explain ratings of IC regulators in detail and Design a dual regulated power supply using 317 & 337 to provide +- 12V to +- 25V.

Max. Marks: 56

16

12

12

#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics and Telecommunication Engineering** ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question 1 is compulsory, It should be solved in first 30 minutes in Answer book.

- 2) Figures to the right indicates full marks.
- 3) Assume suitable data if necessary.

#### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

c)  $R^{2}$ 

Seat

No.

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

- Thermal noise voltage in resistor R is proportional to \_\_\_\_\_. 1) b) R
  - a)  $\sqrt{R}$ 
    - d) independent of R
- 2) Standard intermediate frequency used for AM receiver is \_\_\_\_\_
  - a) 455 MHz b) 455 KHz
  - c) 455 Hz d) None of these
- 3) In the TV receivers, the device used for tuning the receiver to the incoming signal is \_\_\_\_\_
  - a) Varactor diode b) High pass Filter
  - Low pass filter c) Zener diode d)
- 4) In TV transmission, picture signal is modulated.
  - a) Frequency b) Phase c) Amplitude All of these d)
- 5) If a radio receiver amplifies all the signal frequencies equally well, it is said to have high \_\_\_\_\_.
  - Sensitivity b) Selectivity a)
  - Distortion d) Fidelity C)
- What is the ratio of modulating power to total power at 100% modulation? 6)
  - 1:3 b) 1:2 a) c) 2:3 d) 3:2
- 7) For a three stage cascade amplifier, calculate the overall noise figure when each stage has a gain of 12 dB and noise figure of 8dB.
  - 12 a) 24 b) 15 d) 13.55 c)
  - The amplitude of sidebands in FM signal are dependent upon mathematical
- 8) process known as
  - a) Gaussian function b) Shannon's function
  - c) Bessel function d) Fourier function
- 9) Which type of noise does not occur in transistor?
  - Shot noise a) b) Flicker noise
  - Partition noise Resistance noise c) d)

**SLR-FM-681** 

#### Set Ρ

Max. Marks: 70

Marks: 14

increased by factor of  $\sqrt{3}$ 

**SLR-FM-681** 

Set P

- 10) De-emphasis is used .
  - a) To attenuate high modulation frequencies
  - b) To attenuate low modulation frequencies
  - c) To attenuate mid-band modulation frequencies
  - d) To attenuate overall modulation frequencies

#### In FM system, if the depth of modulation is doubled, the output power \_\_\_\_\_. 11) b)

- a) increased by factor of  $\sqrt{2}$
- c) increased by factor of 2
- d) remains at unmodulated value
- Frequency of dialing tone is \_\_\_\_\_. 12)
  - 33Hz a) 50Hz b) c) 800Hz 133Hz d)
- A folded dipole consists of \_\_\_\_\_. 13)
  - b) a) Single element Two elements
  - c) Three elements d) Four elements
- Strowger switching system is \_\_\_\_\_ type of telephone system. 14)
  - a) electronic

- b) Manual d) Electromechanical
- c) automatic

Set

Max. Marks: 56

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#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics and Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Attempt any four of the following questions.

- a) Define and describe Independent Side Band (ISB) transmission with block diagram.
- **b)** Explain the effect of cascade connection on signal to noise ratio.
- c) Describe Frequency Division Multiplexing in brief.
- d) Write a note on Automatic Gain Control (AGC). Why it is required?
- e) Derive the expression for frequency spectrum of AM wave with bandwidth.

#### Q.3 Attempt any two of the following questions.

- a) Calculate the percentage power saving when carrier and one of the sidebands are suppressed in an amplitude modulated wave to a depth of 40 and 60 percent.
- **b)** What are the different types of DSBSC generation? Explain DSBSC using JFET modulator.
- c) Briefly comment on the importance of S/N ratio in a communication system.

#### Section – II

#### Q.4 Attempt any four of the following questions.

- a) With application explain horn antenna.
- **b)** Compare wideband FM and narrowband FM.
- c) With the help of neat diagram explain working of Strowger switching system.
- d) Explain the working principle of ratio detector.
- e) Which types of tones used in telephony?

#### Q.5 Attempt any two of the following questions.

- a) What are the types of wave propagation? Explain any one of them in detail.
- **b)** Draw and explain FET reactance modulator used for FM modulation.
- c) List the relative advantages and disadvantages of AM, FM and PM.

12

16

12

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#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics and Telecommunication Engineering** ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question 1 is compulsory, It should be solved in first 30 minutes in Answer book.

- 2) Figures to the right indicates full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- The amplitude of sidebands in FM signal are dependent upon mathematical 1) process known as
  - a) Gaussian function b)
  - **Bessel function** d) C)
- 2) Which type of noise does not occur in transistor?
  - Shot noise a)
  - C) Partition noise

#### 3) De-emphasis is used

- a) To attenuate high modulation frequencies
- To attenuate low modulation frequencies b)
- To attenuate mid-band modulation frequencies C)
- d) To attenuate overall modulation frequencies
- 4) In FM system, if the depth of modulation is doubled, the output power \_\_\_\_\_. increased by factor of  $\sqrt{3}$ b)

d)

- a) increased by factor of  $\sqrt{2}$
- c) increased by factor of 2
- Frequency of dialing tone is 5)
  - a) 50Hz b) 33Hz c) 800Hz d) 133Hz
- A folded dipole consists of \_\_\_\_ 6)
  - a) Single element b) Two elements
  - c) Three elements d) Four elements
- Strowger switching system is \_\_\_\_\_ type of telephone system. 7)
  - a) electronic b) Manual
  - c) automatic d) Electromechanical
- 8) Thermal noise voltage in resistor R is proportional to .
  - b) R a)  $\sqrt{R}$ c)  $R^{2}$ d) independent of R
- 9) Standard intermediate frequency used for AM receiver is \_\_\_\_\_.
  - a) 455 MHz b)
  - c) 455 Hz d) None of these

Max. Marks: 70

Marks: 14

Shannon's function



- Fourier function
- b) Flicker noise
  - d) **Resistance** noise

455 KHz

remains at unmodulated value




10) In the TV receivers, the device used for tuning the receiver to the incoming signal is \_\_\_\_\_.

b)

- a) Varactor diode
- c) Zener diode d) Low pass filter
- 11) In TV transmission, picture signal is \_\_\_\_
  - a) Frequency b) Phase
  - c) Amplitude d) All of these
- 12) If a radio receiver amplifies all the signal frequencies equally well, it is said to have high \_\_\_\_\_.
  - a) Sensitivity b) Selectivity
  - c) Distortion d) Fidelity
- 13) What is the ratio of modulating power to total power at 100% modulation?

24

- a) 1:3 b) 1:2
- c) 2:3 d) 3:2
- 14) For a three stage cascade amplifier, calculate the overall noise figure when each stage has a gain of 12 dB and noise figure of 8dB.
  - a) 12 b)
  - c) 15 d) 13.55

High pass Filter

\_ modulated.

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**SLR-FM-681** 

Max. Marks: 56

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### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics and Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

### Section – I

### Q.2 Attempt any four of the following questions.

- a) Define and describe Independent Side Band (ISB) transmission with block diagram.
- **b)** Explain the effect of cascade connection on signal to noise ratio.
- c) Describe Frequency Division Multiplexing in brief.
- d) Write a note on Automatic Gain Control (AGC). Why it is required?
- e) Derive the expression for frequency spectrum of AM wave with bandwidth.

### Q.3 Attempt any two of the following questions.

- a) Calculate the percentage power saving when carrier and one of the sidebands are suppressed in an amplitude modulated wave to a depth of 40 and 60 percent.
- **b)** What are the different types of DSBSC generation? Explain DSBSC using JFET modulator.
- c) Briefly comment on the importance of S/N ratio in a communication system.

### Section – II

### Q.4 Attempt any four of the following questions.

- a) With application explain horn antenna.
- **b)** Compare wideband FM and narrowband FM.
- c) With the help of neat diagram explain working of Strowger switching system.
- d) Explain the working principle of ratio detector.
- e) Which types of tones used in telephony?

### Q.5 Attempt any two of the following questions.

- a) What are the types of wave propagation? Explain any one of them in detail.
- **b)** Draw and explain FET reactance modulator used for FM modulation.
- c) List the relative advantages and disadvantages of AM, FM and PM.

12

16

12

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### d) (CGPA) Examination Nov/Dec-2019 **Electronics and Telecommunication Engineering** ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question 1 is compulsory, It should be solved in first 30 minutes in Answer book.

- 2) Figures to the right indicates full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- If a radio receiver amplifies all the signal frequencies equally well, it is 1) said to have high \_\_\_\_\_.
  - a) Sensitivity
  - c) Distortion d)
- 2) What is the ratio of modulating power to total power at 100% modulation?
  - 1:2 1:3 b) a)
  - 2:3 d) 3:2 c)

3) For a three stage cascade amplifier, calculate the overall noise figure when each stage has a gain of 12 dB and noise figure of 8dB.

- a) 12 b) 24 C) 15 d) 13.55
- 4) The amplitude of sidebands in FM signal are dependent upon mathematical process known as
  - a) Gaussian function
- b) Shannon's function
- c) Bessel function d) Fourier function
- 5) Which type of noise does not occur in transistor?
  - a) Shot noise b) Flicker noise
  - c) Partition noise d) Resistance noise

#### De-emphasis is used 6)

- a) To attenuate high modulation frequencies
- b) To attenuate low modulation frequencies
- To attenuate mid-band modulation frequencies C)
- d) To attenuate overall modulation frequencies

7) In FM system, if the depth of modulation is doubled, the output power . increased by factor of  $\sqrt{3}$ 

- a) increased by factor of  $\sqrt{2}$
- b) c) increased by factor of 2 remains at unmodulated value d)
- Frequency of dialing tone is \_\_\_\_\_ 8)
  - 33Hz a) 50Hz b)
  - c) 800Hz d) 133Hz
- 9) A folded dipole consists of \_\_\_\_\_.
  - Single element Two elements a) b)
  - c) Three elements d) Four elements



Marks: 14

Set

R

- Selectivity
- Fidelity

b)

### **SLR-FM-681** Set R Strowger switching system is \_\_\_\_\_ type of telephone system. b) Manual

c) automatic Electromechanical d)

Thermal noise voltage in resistor R is proportional to \_\_\_\_\_. 11)

- a)  $\sqrt{R}$ b)
- c)  $R^2$ d) independent of R

Standard intermediate frequency used for AM receiver is \_\_\_\_\_. 12)

- a) 455 MHz b) 455 KHz c) 455 Hz
  - d) None of these

R

- 13) In the TV receivers, the device used for tuning the receiver to the incoming signal is \_\_\_\_\_.
  - a) Varactor diode
- b) High pass Filter
- c) Zener diode d) Low pass filter
- 14) In TV transmission, picture signal is \_\_\_ modulated.
  - a) Frequency

a) electronic

10)

c) Amplitude

- b) Phase All of these
- d)

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### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics and Telecommunication Engineering ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

### Section – I

### Q.2 Attempt any four of the following questions.

- a) Define and describe Independent Side Band (ISB) transmission with block diagram.
- **b)** Explain the effect of cascade connection on signal to noise ratio.
- c) Describe Frequency Division Multiplexing in brief.
- d) Write a note on Automatic Gain Control (AGC). Why it is required?
- e) Derive the expression for frequency spectrum of AM wave with bandwidth.

### Q.3 Attempt any two of the following questions.

- a) Calculate the percentage power saving when carrier and one of the sidebands are suppressed in an amplitude modulated wave to a depth of 40 and 60 percent.
- **b)** What are the different types of DSBSC generation? Explain DSBSC using JFET modulator.
- c) Briefly comment on the importance of S/N ratio in a communication system.

### Section – II

### Q.4 Attempt any four of the following questions.

- a) With application explain horn antenna.
- **b)** Compare wideband FM and narrowband FM.
- c) With the help of neat diagram explain working of Strowger switching system.
- d) Explain the working principle of ratio detector.
- e) Which types of tones used in telephony?

### Q.5 Attempt any two of the following questions.

- a) What are the types of wave propagation? Explain any one of them in detail.
- **b)** Draw and explain FET reactance modulator used for FM modulation.
- c) List the relative advantages and disadvantages of AM, FM and PM.

12

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Max. Marks: 56

### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics and Telecommunication Engineering** ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) Question 1 is compulsory, It should be solved in first 30 minutes in Answer book.

- 2) Figures to the right indicates full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

2)

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

In FM system, if the depth of modulation is doubled, the output power \_\_\_\_\_.

- 1) De-emphasis is used
  - To attenuate high modulation frequencies a)
  - b) To attenuate low modulation frequencies
  - To attenuate mid-band modulation frequencies C)
  - d) To attenuate overall modulation frequencies
  - a) increased by factor of  $\sqrt{2}$ increased by factor of  $\sqrt{3}$ b) remains at unmodulated value d)
    - c) increased by factor of 2
- 3) Frequency of dialing tone is \_\_\_\_\_
  - a) 50Hz 33Hz b)
  - c) 800Hz d) 133Hz
- A folded dipole consists of \_\_\_\_ 4)
  - b) a) Single element Two elements
    - c) Three elements d) Four elements
- 5) Strowger switching system is \_\_\_\_\_ type of telephone system.
  - b) a) electronic Manual d) Electromechanical c) automatic
- 6) Thermal noise voltage in resistor R is proportional to \_\_\_\_\_.
  - b) R a)  $\sqrt{R}$
  - c)  $R^2$ d) independent of R

7) Standard intermediate frequency used for AM receiver is \_\_\_\_\_.

- a) 455 MHz b) 455 KHz c)
  - 455 Hz d) None of these
- 8) In the TV receivers, the device used for tuning the receiver to the incoming signal is
  - a) Varactor diode b) High pass Filter Low pass filter c) Zener diode d)
- 9) In TV transmission, picture signal is modulated.
  - b) Frequency a)
  - Phase c) Amplitude d) All of these

Set



Marks: 14

Max. Marks: 70

d) **Resistance** noise

- The amplitude of sidebands in FM signal are dependent upon mathematical process known as
  - Shannon's function
    - Fourier function

Flicker noise

- a) Gaussian function b) c) Bessel function
- Which type of noise does not occur in transistor? 14)
  - a) Shot noise

1:3

a) c) 2:3

10)

11)

12)

13)

- c) Partition noise
- b)
- d)
- when each stage has a gain of 12 dB and noise figure of 8dB. a) 12 b) 24 c) 15 d) 13.55
- said to have high \_\_\_\_\_. a) Sensitivity b) Selectivity c) Distortion d) Fidelity

If a radio receiver amplifies all the signal frequencies equally well, it is

What is the ratio of modulating power to total power at 100% modulation?

For a three stage cascade amplifier, calculate the overall noise figure

b)

d)

1:2

3:2

# **SLR-FM-681**

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### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics and Telecommunication Engineering** ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
  - 3) Assume suitable data if necessary.

### Section – I

#### Q.2 Attempt any four of the following questions.

- Define and describe Independent Side Band (ISB) transmission with block a) diagram.
- b) Explain the effect of cascade connection on signal to noise ratio.
- Describe Frequency Division Multiplexing in brief. C)
- Write a note on Automatic Gain Control (AGC). Why it is required? d)
- Derive the expression for frequency spectrum of AM wave with bandwidth. e)

#### Q.3 Attempt any two of the following questions.

- Calculate the percentage power saving when carrier and one of the a) sidebands are suppressed in an amplitude modulated wave to a depth of 40 and 60 percent.
- What are the different types of DSBSC generation? Explain DSBSC using b) JFET modulator.
- Briefly comment on the importance of S/N ratio in a communication C) system.

### Section – II

#### Q.4 Attempt any four of the following questions.

- With application explain horn antenna. a)
- Compare wideband FM and narrowband FM. b)
- With the help of neat diagram explain working of Strowger switching system. c)
- Explain the working principle of ratio detector. d)
- Which types of tones used in telephony? e)

#### Attempt any two of the following questions. Q.5

- What are the types of wave propagation? Explain any one of them in detail. a)
- Draw and explain FET reactance modulator used for FM modulation. b)
- List the relative advantages and disadvantages of AM, FM and PM. c)

12

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Max. Marks: 56

Set

# **SLR-FM-682** Set

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 **ELECTRONICS & TELECOMMUNICATION ENGINEERING** CONTROL SYSTEMS

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) Assume suitable data if required
- 3) Figures to right indicate full marks.

### MCQ/Objective Type Questions

Choose the correct alternatives from the options and rewrite the

**Duration: 30 Minutes** 

Q.1

Marks: 14

- sentence. In an open loop control system 1) a) output is independent of control input b) output is dependent on control input c) only system parameters have effect on the control output d) None of the above 2) has tendency to oscillate. a) Open loop b) Closed loop c) Both a) and b) d) Neither a) nor b) Zero initial condition for a system means \_\_\_\_\_. 3) a) Input reference signal is zero b) Zero stored energy c) No initial movement of moving parts d) System is at rest and no energy is stored in any of its components 4) The capacitance, in force-current analogy, is analogous to \_\_\_\_\_. a) Momentum Velocitv b)
  - c) Displacement d) Mass

The type 1 system has \_\_\_\_\_ at the origin. 5)

- a) no pole b) net pole
- c) simple pole d) two poles
- When two blocks connected in parallel, resultant block is the \_\_\_\_\_ of 6) individual block.
  - a) Product b) Division
  - c) Sum d) Subtraction
- The first two rows of Routh tabulation of a third order system are 7) S<sup>3</sup> I 2 2
  - $S^2 | 4$ Δ
  - a) The characteristic equation has one root in right half s-plane
  - b) The characteristic equation has two roots on the jw axis at  $s=\pm j$
  - c) The characteristic equation has two roots on the jw axis at  $s=\pm 2j$
  - d) None of the these

Max. Marks: 70

			Set	Ρ
8)	<ul> <li>Bode plot of the constant is a</li> <li>a) Line with a slope of -20dB/dec</li> <li>b) Line with a slope of -6 dB/dec</li> <li>c) Line with a slope of -40dB/dec</li> <li>d) Straight line parallel to frequent</li> </ul>	 cade ade cade ncy axis		
9)	In a type-I system, the steady state a) Zero c) Infinity	e accele b) d)	eration error is Unity None of these	
10)	In critically damped system, the da a) Zero c) Less than unity	amping f b) d)	factor of the system is Unity greater than unity	
11)	The addition of zero in the transfer a) Phase lead compensation c) Lag- lead compensation	r functio b) d)	n causes Phase lag compensation None of these	
12)	The phase shift of the second order a) 180 <sup>0</sup> c) 0 <sup>0</sup>	er systei b) d)	m with transfer function 1/S <sup>2</sup> is -180 <sup>0</sup> 90 <sup>0</sup>	<u> </u> .
13)	Starting point of Root Locus are a) open loop poles c) open loop zeros	 b) d)	close loop poles close loop zeros	
14)	A feedback control system has G(s is a) 10	s)H(s) = b)	$=\frac{10}{s(s+2)}$ , the ramp error constant	
	c) 5	d)	None	

Set

Max. Marks: 56

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 ELECTRONICS & TELECOMMUNICATION ENGINEERING CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data whenever necessary.

### **SECTION I**

### Q.2 Attempt any four:

- a) Explain with block diagram Liquid level control system.
- b) Differentiate between open loop and closed loop systems.
- c) What is transfer function? Derive transfer function of closed loop control system.
- d) Explain rules for block diagram reduction.
- e) Define relative stability and conditional stability.
- Q.3 a) Find the transfer function of the system shown below using Mason's gain formula.



- b) Solve any ONE
  - 1) Find the transfer function of the following block diagram

06



2) A unity feedback control system has an open loop transfer function

$$x = \frac{k}{(S+1)^3(S+4)}$$

Determine the range of value of k for the closed loop system be stable.

### SECTION II

### Q.4 Attempt any four

- a) Explain Lag-Lead compensator.
- **b)** Explain different standard test signals.
- c) A second order system is given by following equitation find its Damping Factor, Delay time, Rise time, peak overshoot and.

$$T(s) = \frac{25}{s^2 + 6s + 2}$$

d) Explain how centroid and breakaway points are calculated in root locus.

16



e) Determine the steady state error of given system For Input is  $r(t)=t^2$ 

$$G(s)H(s) = \frac{100}{s^2(1+0.5S)(s+2)}$$

### Q.5 Attempt any two.

a) Sketch the bode plot for the given system

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

#### **Determine:**

- 1) Gain crossover frequency
- 2) Phase crossover frequency
- 3) GM and PM
- 4) Comment on stability of system.
- **b)** Draw the root locus for the system where K varies between K to infinite.

$$G(s)H(s) = \frac{K}{s(s+4)(s+2)}$$

c) For unity feedback system determine

$$G(s)H(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

- 1) Type of system
- 2) Error co-efficients
- 3)  $1+4t+t^2/2$

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 ELECTRONICS & TELECOMMUNICATION ENGINEERING CONTROL SYSTEMS

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

Day & Date: Monday, 25-11-2019 Time: 02.30 PM To 05.30 PM

book. 2) Assume suitable data if required 3) Figures to 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 14 sentence. 1) Bode plot of the constant is a \_\_\_\_\_. a) Line with a slope of -20dB/decade b) Line with a slope of -6 dB/decade c) Line with a slope of -40dB/decade d) Straight line parallel to frequency axis 2) In a type-I system, the steady state acceleration error is \_\_\_\_\_. a) Zero b) Unity c) Infinity d) None of these 3) In critically damped system, the damping factor of the system is \_\_\_\_\_. a) Zero Unitv b) c) Less than unity d) greater than unity 4) The addition of zero in the transfer function causes \_\_\_\_ a) Phase lead compensation Phase lag compensation b) c) Lag-lead compensation None of these d) The phase shift of the second order system with transfer function  $1/S^2$  is \_\_\_\_\_. 5) a) 180<sup>0</sup>  $-180^{\circ}$ b) c) 0<sup>0</sup>  $90^{0}$ d) Starting point of Root Locus are \_\_\_\_\_ 6) b) a) open loop poles close loop poles close loop zeros c) open loop zeros d) A feedback control system has  $G(s)H(s) = \frac{10}{s(s+2)}$ , the ramp error constant 7) is a) 10 b) 2 d) None C) 5 8) In an open loop control system \_\_\_\_ a) output is independent of control input b) output is dependent on control input

Seat No.

Max. Marks: 70

Set

- c) only system parameters have effect on the control output
- d) None of the above

- Set Q 9) has tendency to oscillate. a) Open loop b) Closed loop c) Both a) and b) Neither a) nor b) d) Zero initial condition for a system means \_\_\_\_\_. 10) a) Input reference signal is zero b) Zero stored energy c) No initial movement of moving parts d) System is at rest and no energy is stored in any of its components 11) The capacitance, in force-current analogy, is analogous to \_\_\_\_\_. a) Momentum Velocity b) c) Displacement d) Mass 12) The type 1 system has \_\_\_\_\_ at the origin. a) no pole b) net pole c) simple pole d) two poles When two blocks connected in parallel, resultant block is the \_\_\_\_\_ of 13) individual block. a) Product b) Division c) Sum d) Subtraction 14) The first two rows of Routh tabulation of a third order system are S<sup>3</sup> I 2 2  $S^2 | 4$ 4 a) The characteristic equation has one root in right half s-plane b) The characteristic equation has two roots on the jw axis at  $s=\pm j$ 
  - c) The characteristic equation has two roots on the jw axis at  $s=\pm 2j$
  - d) None of the these

Sef

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 ELECTRONICS & TELECOMMUNICATION ENGINEERING CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data whenever necessary.

### **SECTION I**

### Q.2 Attempt any four:

- a) Explain with block diagram Liquid level control system.
- b) Differentiate between open loop and closed loop systems.
- c) What is transfer function? Derive transfer function of closed loop control system.
- d) Explain rules for block diagram reduction.
- e) Define relative stability and conditional stability.
- Q.3 a) Find the transfer function of the system shown below using Mason's gain formula.



- b) Solve any ONE
  - 1) Find the transfer function of the following block diagram

06



2) A unity feedback control system has an open loop transfer function

$$x = \frac{k}{(S+1)^3(S+4)}$$

Determine the range of value of k for the closed loop system be stable.

### SECTION II

### Q.4 Attempt any four

- a) Explain Lag-Lead compensator.
- **b)** Explain different standard test signals.
- c) A second order system is given by following equitation find its Damping Factor, Delay time, Rise time, peak overshoot and.

$$T(s) = \frac{25}{s^2 + 6s + 2}$$

d) Explain how centroid and breakaway points are calculated in root locus.

Max. Marks: 56

16

- Set Q
- e) Determine the steady state error of given system For Input is  $r(t)=t^2$

$$G(s)H(s) = \frac{100}{s^2(1+0.5S)(s+2)}$$

### Q.5 Attempt any two.

a) Sketch the bode plot for the given system

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

#### **Determine:**

- 1) Gain crossover frequency
- 2) Phase crossover frequency
- 3) GM and PM
- 4) Comment on stability of system.
- **b)** Draw the root locus for the system where K varies between K to infinite.

$$G(s)H(s) = \frac{K}{s(s+4)(s+2)}$$

c) For unity feedback system determine

$$G(s)H(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

- 1) Type of system
- 2) Error co-efficients
- 3)  $1+4t+t^2/2$

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 **ELECTRONICS & TELECOMMUNICATION ENGINEERING CONTROL SYSTEMS**

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) Assume suitable data if required

3) Figures to right indicate full marks.

### MCQ/Objective Type Questions

Q.1 Choose the correct alternatives from the options and rewrite the 14 sentence. The type 1 system has \_\_\_\_\_ at the origin. 1) a) no pole b) net pole c) simple pole d) two poles 2) When two blocks connected in parallel, resultant block is the of individual block. a) Product b) Division c) Sum d) Subtraction 3) The first two rows of Routh tabulation of a third order system are  $S^{3} | 2$ 2  $S^2 | 4$ 4 a) The characteristic equation has one root in right half s-plane b) The characteristic equation has two roots on the jw axis at  $s=\pm j$ c) The characteristic equation has two roots on the jw axis at  $s=\pm 2j$ d) None of the these 4) Bode plot of the constant is a a) Line with a slope of -20dB/decade b) Line with a slope of -6 dB/decade c) Line with a slope of -40dB/decade d) Straight line parallel to frequency axis 5) In a type-I system, the steady state acceleration error is \_\_\_\_\_. a) Zero b) Unitv c) Infinity d) None of these In critically damped system, the damping factor of the system is \_\_\_\_\_. 6) a) Zero Unitv b) c) Less than unity d) greater than unity 7) The addition of zero in the transfer function causes \_\_\_\_\_ a) Phase lead compensation Phase lag compensation b) c) Lag-lead compensation d) None of these

### **SLR-FM-682**

Max. Marks: 70

Marks: 14

Set

			SLR-FM-682
			Set R
8)	The phase shift of the second order a) 180 <sup>0</sup> c) 0 <sup>0</sup>	r syste b) d)	m with transfer function 1/S <sup>2</sup> is -180 <sup>0</sup> 90 <sup>0</sup>
9)	Starting point of Root Locus are a) open loop poles c) open loop zeros	 b) d)	close loop poles close loop zeros
10)	A feedback control system has G(s)	H(s) =	$=\frac{10}{s(s+2)}$ , the ramp error constant
	is a) 10 c) 5	b) d)	2 None
11)	<ul> <li>In an open loop control system</li> <li>a) output is independent of control</li> <li>b) output is dependent on control</li> <li>c) only system parameters have e</li> <li>d) None of the above</li> </ul>	 I input input effect o	on the control output
12)	<ul> <li>has tendency to oscillate.</li> <li>a) Open loop</li> <li>c) Both a) and b)</li> </ul>	b) d)	Closed loop Neither a) nor b)
13)	<ul> <li>Zero initial condition for a system m</li> <li>a) Input reference signal is zero</li> <li>b) Zero stored energy</li> <li>c) No initial movement of moving</li> <li>d) System is at rest and no energy</li> </ul>	parts y is sto	 pred in any of its components
14)	The capacitance, in force-current a a) Momentum	nalogy b)	v, is analogous to Velocity

- c) Displacement d)
- Mass

Set

Max. Marks: 56

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 ELECTRONICS & TELECOMMUNICATION ENGINEERING CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data whenever necessary.

### **SECTION I**

### Q.2 Attempt any four:

- a) Explain with block diagram Liquid level control system.
- b) Differentiate between open loop and closed loop systems.
- c) What is transfer function? Derive transfer function of closed loop control system.
- d) Explain rules for block diagram reduction.
- e) Define relative stability and conditional stability.
- Q.3 a) Find the transfer function of the system shown below using Mason's gain formula.



- b) Solve any ONE
  - 1) Find the transfer function of the following block diagram

06



2) A unity feedback control system has an open loop transfer function

$$x = \frac{k}{(S+1)^3(S+4)}$$

Determine the range of value of k for the closed loop system be stable.

### SECTION II

### Q.4 Attempt any four

- a) Explain Lag-Lead compensator.
- **b)** Explain different standard test signals.
- c) A second order system is given by following equitation find its Damping Factor, Delay time, Rise time, peak overshoot and.

$$T(s) = \frac{25}{s^2 + 6s + 2}$$

d) Explain how centroid and breakaway points are calculated in root locus.

R

16

- Set R
- e) Determine the steady state error of given system For Input is  $r(t)=t^2$

$$G(s)H(s) = \frac{100}{s^2(1+0.5S)(s+2)}$$

### Q.5 Attempt any two.

a) Sketch the bode plot for the given system

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

#### **Determine:**

- 1) Gain crossover frequency
- 2) Phase crossover frequency
- 3) GM and PM
- 4) Comment on stability of system.
- **b)** Draw the root locus for the system where K varies between K to infinite.

$$G(s)H(s) = \frac{K}{s(s+4)(s+2)}$$

c) For unity feedback system determine

$$G(s)H(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

- 1) Type of system
- 2) Error co-efficients
- 3)  $1+4t+t^2/2$

nly system parameters have e lone of the above	ffect c	on the control output	
_ has tendency to oscillate. Open loop Both a) and b)	b) d)	Closed loop Neither a) nor b)	
initial condition for a system monput reference signal is zero Zero stored energy lo initial movement of moving p System is at rest and no energy	eans <u>-</u> oarts ' is sto	 ored in any of its components	
			Page <b>13</b> of

**ELECTRONICS & TELECOMMUNICATION ENGINEERING** CONTROL SYSTEMS Max. Marks: 70

Seat

No.

book. 2) Assume suitable data if required 3) Figures to right indicate full marks. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 14 14 Q.1 Choose the correct alternatives from the options and rewrite the sentence. In critically damped system, the damping factor of the system is \_\_\_\_\_. 1) a) Zero Unitv b) c) Less than unity d) greater than unity 2) The addition of zero in the transfer function causes \_ Phase lag compensation a) Phase lead compensation b) c) Lag-lead compensation None of these d) The phase shift of the second order system with transfer function 1/S<sup>2</sup> is \_\_\_\_\_. 3)  $-180^{\circ}$ a) 180<sup>°</sup> b)  $90^{0}$ c)  $0^{0}$ d) Starting point of Root Locus are \_\_\_\_ 4) a) open loop poles b) close loop poles c) open loop zeros close loop zeros d) A feedback control system has  $G(s)H(s) = \frac{10}{s(s+2)}$ , the ramp error constant 5) is 10 2 a) b) 5 d) C) None In an open loop control system \_\_\_\_ 6) a) output is independent of control input b) output is dependent on control input c) o d) N 7) a) O В c) 8) Zero a) Ir b) Z c) N d) S

# S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019

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

Day & Date: Monday, 25-11-2019 Time: 02.30 PM To 05.30 PM

## **SLR-FM-682**

Set

- 9) The capacitance, in force-current analogy, is analogous to \_\_\_\_\_.
  - a) Momentum

b) Velocity

**SLR-FM-682** 

Set S

- c) Displacement d) Mass
- 10) The type 1 system has \_\_\_\_\_ at the origin.
  - a) no pole b) net pole
  - c) simple pole d) two poles
- 11) When two blocks connected in parallel, resultant block is the \_\_\_\_\_ of individual block.
  - a) Product

- b) Division
- c) Sum d) Subtraction
- 12) The first two rows of Routh tabulation of a third order system are  $S_{1}^{3} \mid 2 = 2$ 
  - $S^2 | 4 4$
  - a) The characteristic equation has one root in right half s-plane
  - b) The characteristic equation has two roots on the jw axis at s=±j
  - c) The characteristic equation has two roots on the jw axis at  $s=\pm 2j$
  - d) None of the these
- 13) Bode plot of the constant is a \_
  - a) Line with a slope of -20dB/decade
  - b) Line with a slope of -6 dB/decade
  - c) Line with a slope of -40dB/decade
  - d) Straight line parallel to frequency axis
- 14) In a type-I system, the steady state acceleration error is \_\_\_\_\_.
  - a) Zero

- b) Unityd) None of these
- c) Infinity d)

Page **14** of **16** 

Set

Max. Marks: 56

### S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019 ELECTRONICS & TELECOMMUNICATION ENGINEERING CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

2) Assume the suitable data whenever necessary.

### **SECTION I**

### Q.2 Attempt any four:

- a) Explain with block diagram Liquid level control system.
- b) Differentiate between open loop and closed loop systems.
- c) What is transfer function? Derive transfer function of closed loop control system.
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- b) Solve any ONE
  - 1) Find the transfer function of the following block diagram

06



2) A unity feedback control system has an open loop transfer function

$$x = \frac{k}{(S+1)^3(S+4)}$$

Determine the range of value of k for the closed loop system be stable.

### SECTION II

### Q.4 Attempt any four

- a) Explain Lag-Lead compensator.
- **b)** Explain different standard test signals.
- c) A second order system is given by following equitation find its Damping Factor, Delay time, Rise time, peak overshoot and.

$$T(s) = \frac{25}{s^2 + 6s + 2}$$

d) Explain how centroid and breakaway points are calculated in root locus.

16



e) Determine the steady state error of given system For Input is  $r(t)=t^2$ 

$$G(s)H(s) = \frac{100}{s^2(1+0.5S)(s+2)}$$

### Q.5 Attempt any two.

a) Sketch the bode plot for the given system

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#### **Determine:**

- 1) Gain crossover frequency
- 2) Phase crossover frequency
- 3) GM and PM
- 4) Comment on stability of system.
- **b)** Draw the root locus for the system where K varies between K to infinite.

$$G(s)H(s) = \frac{K}{s(s+4)(s+2)}$$

c) For unity feedback system determine

$$G(s)H(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

- 1) Type of system
- 2) Error co-efficients

3)  $1+4t+t^2/2$ 

#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** LINEAR INTEGRATED CIRCUITS Max. Marks: 70 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 Choose the correct alternatives from the options and rewrite the sentence. For Summing amplifier the ratio of $R_f/r_1$ must be \_\_\_\_\_. a) Zero b) One c) Infinite d) Less than one

2) When square wave signal is input to the differentiator then output is

	a) Triangular	b)	Spikes
	c) Square wave	d)	None
3)	Gain bandwidth product of IC 741 is	s	
	a) 10 MHz	b)	1 MHz
	c) infinite	d)	1 KHz
4)	Slew rate of the IC 741 is a) 0.5 V/µsec c) 150 V/µsec	b) d)	5 V/ μsec None
5)	Gain of opamp is decided by follow	ing cir	cuit.
	a) DIBO Amplifier	b)	Current Mirror
	c) Level Shifter	d)	None
6)	Which of the following is the examp	ble of d	comparator?
	a) ZCD	b)	Schmitt trigger
	c) Window detector	d)	All
7)	Schmitt Trigger is also called as a) Square wave generator c) Triangular generator	b) d)	Squaring circuit None
8)	The gain for wein bridge oscillator a	at resc	onance is given by _
	a) 4	b)	29
	c) 3	d)	1.16
9)	Which of the following is sinusoidal	oscilla	ator?
	a) Wein bridge	b)	Phase shift
	c) Quadrature	d)	All of above

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

Seat

No.

Q.1

1)

# **SLR-FM-683**

14

Set Ρ

#### 10) The advantage of active filter is \_\_\_\_\_. a) Gain adjustment flexibility b) Frequency adjustment flexibility c) Both a) and b) d) None of these 11) Analog multipliers are available as \_ a) One quadrant Two quadrant b) c) Four quadrant d) All above Using log amplifier we can perform 12) a) log<sub>n</sub> (x) b) $log_{10}(x)$ c) sinh (x) d) all above Butterworth filter is also known as 13) \_\_\_\_ filter. a) Flat flat b) flat ripple c) ripple rippled none d) Gain of opamp as buffer is \_\_\_\_\_. 14) a) zero b) infinite c) unity d) less than one

**SLR-FM-683** 

Set P

Seat	
No.	

### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering LINEAR INTEGRATED CIRCUITS

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain current mirror circuit.
- **b)** What is virtual ground concept? How it is useful in simplifying circuit analysis?
- c) Explain high frequency equivalent circuit of opamp.
- d) Explain V-I convertor with floating load.
- e) Define: CMRR, PSRR, Slew Rate, Vio

### Q.3 Solve any two.

- a) Explain opamp as adder, averaging and scaling amplifier.
- b) Explain block diagram of Opamp with parameters contributed by each block.
- c) How opamp can be used as Integrator?

### Section – II

### Q.4 Solve any four

- a) Explain ZCD in inverting and non inverting mode.
- b) Explain square wave generator.
- c) Explain advantages of active filters over passive filters.
- d) Explain the Block diagram of PLL.
- e) How diode can be used with opamp to act as half wave rectifier?

### Q.5 Solve any two.

- a) Design the first order Butterworth filter with  $F_{L}$ = 1 KHz with gain 2.
- **b)** Design the Wein bridge oscillator to generate frequency of 500 Hz.
- c) Explain in detail IC 8038 & its working.



Max. Marks: 56

12

12

16

Page <b>4</b> of <b>12</b>	

Set

Q

#### No. S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** LINEAR INTEGRATED CIRCUITS 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 gain for wein bridge oscillator at resonance is given by \_\_\_\_\_ 1) a) 4 b) 29 1.16 d) c) 3 Which of the following is sinusoidal oscillator? 2) a) Wein bridge b) Phase shift d) c) Quadrature All of above The advantage of active filter is \_\_\_\_ 3) a) Gain adjustment flexibility

- b) Frequency adjustment flexibility
- c) Both a) and b)
- d) None of these

#### 4) Analog multipliers are available as \_

a) One quadrant b) Two quadrant c) Four quadrant All above d)

#### 5) Using log amplifier we can perform

- a)  $\log_{n}(x)$ b)  $\log_{10}(\mathbf{x})$ c) sinh (x) d) all above
- Butterworth filter is also known as \_\_\_ filter. 6)
  - a) Flat flat b) flat ripple
- c) ripple rippled d) none Gain of opamp as buffer is \_\_\_\_\_. 7)
- a) zero b) infinite
  - d) less than one c) unity
- For Summing amplifier the ratio of R<sub>f</sub>/r<sub>1</sub> must be \_\_\_\_ 8)
  - Zero b) One a)
  - c) Infinite d) Less than one
- When square wave signal is input to the differentiator then output is 9)
  - Triangular b) Spikes a) None
    - c) Square wave d)

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

Seat

Max. Marks: 70

**SLR-FM-683** Set Q

#### 10) Gain bandwidth product of IC 741 is

- a) 10 MHz b) 1 MHz
- c) infinite d) 1 KHz

#### Slew rate of the IC 741 is \_\_\_\_\_. 11)

- a) 0.5 V/µsec b) 5 V/ µsec
- c) 150 V/µsec d) None
- Gain of opamp is decided by following circuit. 12)
  - a) DIBO Amplifier **Current Mirror** b)
  - c) Level Shifter d) None
- 13) Which of the following is the example of comparator?
  - a) ZCD Schmitt trigger b)
  - c) Window detector d) All

#### 14) Schmitt Trigger is also called as \_\_\_\_

- a) Square wave generator
- c) Triangular generator d)
- Squaring circuit b)
  - None

Seat	
No.	

### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering LINEAR INTEGRATED CIRCUITS

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain current mirror circuit.
- **b)** What is virtual ground concept? How it is useful in simplifying circuit analysis?
- c) Explain high frequency equivalent circuit of opamp.
- d) Explain V-I convertor with floating load.
- e) Define: CMRR, PSRR, Slew Rate, Vio

### Q.3 Solve any two.

- a) Explain opamp as adder, averaging and scaling amplifier.
- b) Explain block diagram of Opamp with parameters contributed by each block.
- c) How opamp can be used as Integrator?

### Section – II

### Q.4 Solve any four

- a) Explain ZCD in inverting and non inverting mode.
- b) Explain square wave generator.
- c) Explain advantages of active filters over passive filters.
- d) Explain the Block diagram of PLL.
- e) How diode can be used with opamp to act as half wave rectifier?

### Q.5 Solve any two.

- a) Design the first order Butterworth filter with  $F_{L}$ = 1 KHz with gain 2.
- **b)** Design the Wein bridge oscillator to generate frequency of 500 Hz.
- c) Explain in detail IC 8038 & its working.



16

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Max. Marks: 56

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	LINEAR INTEGRATED CIRCUITS					
Day & Time:	& Date 02:30	:: Tuesday, 26-11-2019 ) PM To 05:30 PM		Max. Marks: 70		
Instru	uction	<b>is:</b> 1) Q. No. 1 is compulsory and s Book.	hould l	be solved in first 30 minutes in answer		
		2) Figures to the right indicate f	ull mar	ks.		
		MCQ/Objective	Туре	Questions		
Durat	ion: 3	0 Minutes		Marks: 14		
Q.1	<b>Choc</b> 1)	<ul> <li>bse the correct alternatives from</li> <li>Gain of opamp is decided by follow</li> <li>a) DIBO Amplifier</li> <li>c) Level Shifter</li> </ul>	the op wing cir b) d)	tions and rewrite the sentence. 14 rcuit. Current Mirror None		
	2)	<ul><li>Which of the following is the example</li><li>a) ZCD</li><li>c) Window detector</li></ul>	nple of b) d)	comparator? Schmitt trigger All		
	3)	Schmitt Trigger is also called as _ a) Square wave generator c) Triangular generator	b) d)	Squaring circuit None		
	4)	The gain for wein bridge oscillator a) 4 c) 3	at reso b) d)	onance is given by 29 1.16		
	5)	<ul><li>Which of the following is sinusoida</li><li>a) Wein bridge</li><li>c) Quadrature</li></ul>	al oscill b) d)	ator? Phase shift All of above		
	6)	<ul> <li>The advantage of active filter is</li> <li>a) Gain adjustment flexibility</li> <li>b) Frequency adjustment flexibilities</li> <li>c) Both a) and b)</li> <li>d) None of these</li> </ul>				
	7)	<ul><li>Analog multipliers are available as</li><li>a) One quadrant</li><li>c) Four quadrant</li></ul>	s b) d)	Two quadrant All above		
	8)	Using log amplifier we can perform a) log <sub>n</sub> (x) c) sinh (x)	n b) d)	log₁₀ (x) all above		
	9)	Butterworth filter is also known as	b)	filter.		

a) Flat flatb) flat ripplec) ripple rippledd) none

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering

Seat	
No.	

Set R

#### Gain of opamp as buffer is \_\_\_\_\_. 10) b) infinite a) zero c) unity less than one d) For Summing amplifier the ratio of $R_f/r_1$ must be \_\_\_\_\_. 11) a) Zero b) One c) Infinite d) Less than one When square wave signal is input to the differentiator then output is 12) Triangular Spikes a) b) c) Square wave d) None 13) Gain bandwidth product of IC 741 is \_ 1 MHz a) 10 MHz b) c) infinite d) 1 KHz Slew rate of the IC 741 is \_\_\_\_\_. 14) a) 0.5 V/µsec b) 5 V/ µsec

d)

None

c) 150 V/µsec

**SLR-FM-683** 

Set R

Seat	
No.	

### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering LINEAR INTEGRATED CIRCUITS

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain current mirror circuit.
- **b)** What is virtual ground concept? How it is useful in simplifying circuit analysis?
- c) Explain high frequency equivalent circuit of opamp.
- d) Explain V-I convertor with floating load.
- e) Define: CMRR, PSRR, Slew Rate, Vio

### Q.3 Solve any two.

- a) Explain opamp as adder, averaging and scaling amplifier.
- b) Explain block diagram of Opamp with parameters contributed by each block.
- c) How opamp can be used as Integrator?

### Section – II

### Q.4 Solve any four

- a) Explain ZCD in inverting and non inverting mode.
- b) Explain square wave generator.
- c) Explain advantages of active filters over passive filters.
- d) Explain the Block diagram of PLL.
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### Q.5 Solve any two.

- a) Design the first order Butterworth filter with  $F_{L}$ = 1 KHz with gain 2.
- **b)** Design the Wein bridge oscillator to generate frequency of 500 Hz.
- c) Explain in detail IC 8038 & its working.



Max. Marks: 56

12

16

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No.	Seat	
	No.	

### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** LINEAR INTEGRATED CIRCUITS

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) 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 advantage of active filter is \_\_\_\_\_.
- a) Gain adjustment flexibility
- b) Frequency adjustment flexibility
- c) Both a) and b)
- d) None of these

2)	Analog multipliers are available as				
,	a)	One quadrant	b)	Two quadrant	
	0)	Four quadrant	u)	All above	

- 3) Using log amplifier we can perform
  - a)  $\log_{n}(x)$  $log_{10}(x)$ b)
  - c) sinh (x) d) all above
- 4) Butterworth filter is also known as filter. a) Flat flat flat ripple b)
  - c) ripple rippled d) none
- Gain of opamp as buffer is 5) a) zero b) infinite
  - c) unity d) less than one
- For Summing amplifier the ratio of  $R_{f}/r_{1}$  must be 6)
  - a) Zero b) One
- c) Infinite d) Less than one
- 7) When square wave signal is input to the differentiator then output is
  - Triangular Spikes b) a) c) Square wave None d)
- 8) Gain bandwidth product of IC 741 is
  - a) 10 MHz b) 1 MHz c) infinite d) 1 KHz
- Slew rate of the IC 741 is \_\_\_\_\_. 9) a) 0.5 V/µsec 5 V/ µsec b) c) 150 V/µsec d) None



Max. Marks: 70

10)	Gain of opamp is decided by following circuit.					
	a)	DIBO Amplifier	b)	Current Mirror		
	c)	Level Shifter	d)	None		
11)	Whi	Which of the following is the example of comparator?				
	a)	ZCD	b)	Schmitt trigger		
	c)	Window detector	d)	All		
12)	Sch	mitt Trigger is also called as				
,	a)	Square wave generator	b)	Squaring circuit		
	c)	Triangular generator	d)	None		
13)	The	gain for wein bridge oscillator at	resor	nance is given by		
,	a)	4	b)	29		
	c)	3	d)	1.16		
14)	Which of the following is sinusoidal oscillator?					
,	a)	Wein bridge	b)	Phase shift		

c) Quadrature d) All of above

**SLR-FM-683** 

Set S

Seat	
No.	

### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering LINEAR INTEGRATED CIRCUITS

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

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain current mirror circuit.
- **b)** What is virtual ground concept? How it is useful in simplifying circuit analysis?
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### Q.4 Solve any four

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- b) Explain square wave generator.
- c) Explain advantages of active filters over passive filters.
- d) Explain the Block diagram of PLL.
- e) How diode can be used with opamp to act as half wave rectifier?

### Q.5 Solve any two.

- a) Design the first order Butterworth filter with  $F_{L}$ = 1 KHz with gain 2.
- **b)** Design the Wein bridge oscillator to generate frequency of 500 Hz.
- c) Explain in detail IC 8038 & its working.



Max. Marks: 56

12

16

16
Instr	uctio	<b>ns:</b> 1	) Q. No. 1 is compulsory and	it s	hould be solved in first 30 minutes in
		2)	Figures to the right indicate full	mar	ks.
		,	MCQ/Objective Ty	/pe	Questions
Dura	tion: 3	30 Mir	nutes		Marks: 14
Q.1	Cho	ose t	he correct alternatives given l	oelo	w and rewrite the sentence. 14
	1)	The a) c)	discrete time signal $x(n) = (-1)$ 6 2	) <sup>n</sup> is b) d)	periodic with fundamental period. 4 0
	2)	Perio a) c)	odic signals are x(t + T) = x(t) x(n + mN) = x(n)	b) d)	x(t - T) = x(t) All above
	3)	A us a) c)	for the unit impulse $\delta(at)$ $\delta(at) = \frac{1}{a}\delta(t)$	δ (t b) d)	) is that $\delta(at) = \delta(t)$ $\delta(at) = [\delta(t)]^a$
	4)	lf sig a) c)	gnal f(t) has energy , E, the ener E 2E	gy o b) d)	f signal f(2t) is equal to E/2 4E
	5)	A giv $\frac{d^2y(t)}{dt^2}$ a) c)	ven system is characterized by t $\frac{y}{dt} - \frac{dt(t)}{dt} - 2y(t) = x(t)$ The syst Linear and unstable Nonlinear and unstable	he d em i b) d)	lifferential equation : s. Linear and stable Nonlinear and stable
	6)	The a) c)	system characterized by the eq Linear for any value of b Linear if b<0	uatio b) d)	on y(t) = ax(t) + b Linear if b>0 Non linear
	7)	lf h(i a) c)	n) = $[\delta(n-l) - \delta(n)]^* \delta(n-1) t$ h(n) = $[\delta(n) - \delta(n-1)]$ h(n) = $[\delta(n+1) - \delta(n-1)]$	hen b) d)	alternatively written as $h(n) = [\delta(n-1) - \delta(n)]$ None
	8)	The from a) c)	frequency of a continuous time $x(t)$ to $x(\alpha t)$ , $\alpha > 1$ by a factor _ $\alpha$ $\alpha^2$	sign b) d)	al x(t) changes on transformation $\frac{1}{\alpha}$ . None
	9)	Foui a) c)	rier spectrum (transform) of non Magnitude spectrum Both a & b	-peri b) d)	ods signal will have Phase spectrum Constant value
	10)	Inve a) c)	rse FT of 1 is u(t) 0	b) d)	$\partial(t)$ Infinite

#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

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Set

**SLR-FM-684** 

Max. Marks: 70

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- 11)
- Dirichlet conditions for periodic signals are in each period.
  a) function x(t) has only finite number of maxima & minima
  b) function x(t) has finite number of discontinuities

  - function x(t) is absolutely integrable over one period C)
  - All of above d)

12)	<ul><li>ROC of x(n) contains</li><li>a) Poles</li><li>c) No poles</li></ul>	b) d)	Zeros No zeros
13)	ROC of ZT of unit step seq is a) $ Z  < 1$ c) Real part of Z > 0	b) d)	Z  > 1 $ Z  = 0$
14)	Inverse ZT of X(Z/a) a) $x(n/a)$ c) $a^nx(n)$	b) d)	x(n)/a ax(n)

#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### Section – I

#### Q.2 Attempt any four of the following questions.

Find even and odd components of the following signals. a)

- 1)  $x(t) = 1 + t + 3t^{2} + 5t^{3} + 9t^{4}$ 2)  $x(t) = 1 + t\cos(t) + t^{2}\sin(t) + t^{3}\sin(t)\cos(t)$
- Explain operations performed on independent variables. b)
- Determine whether the following signal is periodic or non-periodic. If c) periodic find its fundamental period. 1)  $sin^{3}(2t)$
- Explain properties of LTI Systems. d)
- Draw Direct form-I and Direct form-II implementation for the following LTI e) system.

$$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$$

#### Q.3 Attempt any Two of the following questions.

Verify the general property of system for the following system. a) А

$$\frac{d}{dt}y(t) + ty(t) = x(t)$$

- 1) Find the step response of the following system h(t) = t u(t). Justify also b) whether LTI system is stable or not stable.
  - 2) State and prove the properties of convolution integral.
- Perform the convolution operation of two function in time domain. c) h(t ;)

$$t) = e^{-2t} u(t)$$
 and  $x(t) = e^{-t} u(t)$ 

#### Section – II

#### Attempt any four of the following questions. Q.4

- State & explain sampling theorem. a)
- Explain modulation property of FT. b)
- Find ZT & sketch ROC c)
- $x(n) = (0.6)^n u(n) + (0.4)^n u(n)$
- d)
- Find ZT of x(n) = u(n + 1)u(n)Find inverse ZT of  $X(Z) = \frac{z}{2z^2-3z+1}$  & ROC is |Z| > 1e)

#### Attempt any Two of the following questions. Q.5

- Consider analog signal  $x(t) = 3 \cos 2000\pi t + 5 \sin 6000\pi t + 10 \cos 1000\pi t$ . a) What is sampling rate? i)
  - For this signal assuming that signal is sampled using fs=5000Hz. ii) What is DT signal?
- Determine FT of  $x(t) = e^{-a|t|}$  & plot magnitude spectrum. b)
- Find ZT of  $x(n) = n^2 u(n)$ C)

Max. Marks: 56

12

16

12

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MCQ/Objective Type Questions							
Dura	Duration: 30 Minutes Mark						
Q.1	<ul> <li>1 Choose the correct alternatives given below and rewrite the sentence.</li> <li>1) The frequency of a continuous time signal x(t) changes on transformation from x(t) to x(αt), α &gt; 1 by a factor</li> </ul>			w and rewrite the sentence. al $x(t)$ changes on transformation			
		a) c)	$\frac{\alpha}{\alpha^2}$	b) d)	1/α None		
	2)	Fou a) c)	rier spectrum (transform) of non Magnitude spectrum Both a & b	-peri b) d)	ods signal will have Phase spectrum Constant value		
	3)	Inve a) c)	erse FT of 1 is u(t) 0	b) d)	$\partial(t)$ Infinite		
	4)	Dirio a) b) c) d)	chlet conditions for periodic signal function $x(t)$ has only finite num function $x(t)$ has finite number function $x(t)$ is absolutely integ All of above	conditions for periodic signals are in each period. tion x(t) has only finite number of maxima & minima tion x(t) has finite number of discontinuities tion x(t) is absolutely integrable over one period f above			
	5)	RO( a) c)	C of x(n) contains Poles No poles	b) d)	Zeros No zeros		
	6)	RO( a) c)	C of ZT of unit step seq is  Z  < 1 Real part of Z > 0	b) d)	Z  > 1 $ Z  = 0$		
	7)	Inve a) c)	erse ZT of X(Z/a) x(n/a) $a^nx(n)$	b) d)	x(n)/a ax(n)		
	8)	The a) c)	discrete time signal $x(n) = (-1)$ 6 2	) <sup>n</sup> is b) d)	periodic with fundamental period. 4 0		

Day & Date: Wednesday, 27-11-2019 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.

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2) Figures to the right indicate full marks.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** 

**SLR-FM-684** 

Max. Marks: 70

Set

- Periodic signals are \_\_\_\_\_. 9)
  - $\mathbf{x}(\mathbf{t} + \mathbf{T}) = \mathbf{x}(\mathbf{t})$ a)
  - $\mathbf{x}(\mathbf{n} + \mathbf{m}\mathbf{N}) = \mathbf{x}(\mathbf{n})$ c)
- b) x(t T) = x(t)
- d) All above



No.

- ks: 14
- 14

Set Q

10) A useful property of the unit impulse  $\delta$  (t) is that

a) δ(at)

c)

b) 
$$\delta(at) = \delta(t)$$

$$\delta(at) = \frac{1}{a}\delta(t)$$
 d)  $\delta(at) = [\delta(t)]^a$ 

11) If signal f(t) has energy, E, the energy of signal f(2t) is equal to \_\_\_\_\_. a) E b) E/2

2E c) d) 4E

12) A given system is characterized by the differential equation :  $\frac{d^2y(t)}{dt^2} - \frac{dt(t)}{dt} - 2y(t) = x(t)$  The system is.

- a) Linear and unstable
  - b) Linear and stable
  - d) Nonlinear and stable
- 13) The system characterized by the equation y(t) = ax(t) + bb) Linear if b>0
  - a) Linear for any value of b c) Linear if b<0

c) Nonlinear and unstable

- d) Non linear
- 14) If  $h(n) = [\delta(n-l) \delta(n)]^* \delta(n-1)$  then alternatively written as \_\_\_\_\_.
  - a)  $h(n) = [\delta(n) \delta(n-1)]$  b)  $h(n) = [\delta(n-1) \delta(n)]$
- - $h(n) = [\delta(n+1) \delta(n-1)] \quad \text{d) None}$ C)

#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### Section – I

#### Q.2 Attempt any four of the following questions.

Find even and odd components of the following signals. a)

- 1)  $x(t) = 1 + t + 3t^{2} + 5t^{3} + 9t^{4}$ 2)  $x(t) = 1 + t\cos(t) + t^{2}\sin(t) + t^{3}\sin(t)\cos(t)$
- Explain operations performed on independent variables. b)
- Determine whether the following signal is periodic or non-periodic. If c) periodic find its fundamental period. 1)  $sin^{3}(2t)$
- Explain properties of LTI Systems. d)
- Draw Direct form-I and Direct form-II implementation for the following LTI e) system.

$$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$$

#### Q.3 Attempt any Two of the following questions.

Verify the general property of system for the following system. a) А

$$\frac{d}{dt}y(t) + ty(t) = x(t)$$

- 1) Find the step response of the following system h(t) = t u(t). Justify also b) whether LTI system is stable or not stable.
  - 2) State and prove the properties of convolution integral.
- Perform the convolution operation of two function in time domain. c) h(t ;)

$$t) = e^{-2t} u(t)$$
 and  $x(t) = e^{-t} u(t)$ 

#### Section – II

#### Attempt any four of the following questions. Q.4

- State & explain sampling theorem. a)
- Explain modulation property of FT. b)
- Find ZT & sketch ROC c)
- $x(n) = (0.6)^n u(n) + (0.4)^n u(n)$
- d)
- Find ZT of x(n) = u(n + 1)u(n)Find inverse ZT of  $X(Z) = \frac{z}{2z^2-3z+1}$  & ROC is |Z| > 1e)

#### Attempt any Two of the following questions. Q.5

- Consider analog signal  $x(t) = 3 \cos 2000\pi t + 5 \sin 6000\pi t + 10 \cos 1000\pi t$ . a) What is sampling rate? i)
  - For this signal assuming that signal is sampled using fs=5000Hz. ii) What is DT signal?
- Determine FT of  $x(t) = e^{-a|t|}$  & plot magnitude spectrum. b)
- Find ZT of  $x(n) = n^2 u(n)$ C)

Max. Marks: 56

16

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## S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

**Duration: 30 Minutes** 

Seat No.

**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

# **Q.1** Choose the correct alternatives given below and rewrite the sentence.

- 1) A given system is characterized by the differential equation :  $d^{2}y(t) = dt(t)$ 
  - $\frac{d^2y(t)}{dt^2} \frac{dt(t)}{dt} 2y(t) = x(t)$  The system is.
  - a) Linear and unstablec) Nonlinear and unstable
    - e d) Nonlinear and stable

b) Linear and stable

- 2) The system characterized by the equation y(t) = ax(t) + b
  - a) Linear for any value of b b) Linear if b>0
  - c) Linear if b<0 d) Non linear
- 3) If  $h(n) = [\delta(n-l) \delta(n)]^* \delta(n-1)$  then alternatively written as \_\_\_\_\_.
  - a)  $h(n) = [\delta(n) \delta(n-1)]$  b)  $h(n) = [\delta(n-1) \delta(n)]$
  - c)  $h(n) = [\delta(n+1) \delta(n-1)]$  d) None
- 4) The frequency of a continuous time signal x(t) changes on transformation from x(t) to  $x(\alpha t), \alpha > 1$  by a factor \_\_\_\_\_.
  - a)  $\alpha$  b)  $1/\alpha$
  - c)  $\alpha^2$  d) None
- 5) Fourier spectrum (transform) of non-periods signal will have \_\_\_\_\_.
  a) Magnitude spectrum b) Phase spectrum
  c) Both a & b d) Constant value
- 6) Inverse FT of 1 is \_\_\_\_\_. a) u(t) b)  $\partial(t)$ c) 0 d) Infinite
- 7) Dirichlet conditions for periodic signals are in each period.
  - a) function x(t) has only finite number of maxima & minima
  - b) function x(t) has finite number of discontinuities
  - c) function x(t) is absolutely integrable over one period
  - d) All of above

# 8) ROC of x(n) contains \_\_\_\_\_.a) Poles \_\_\_\_\_\_ b) Zeros

- c) No poles d) No zeros
- 9) ROC of ZT of unit step seq is \_\_\_\_\_.
  a) |Z| < 1</li>
  b) |Z| > 1
  - a) |Z| < 1b) |Z| > 1c) Real part of Z > 0d) |Z| = 0

SLR-FM-684

Max. Marks: 70



Marks: 14

Set R 10) Inverse ZT of X(Z/a) \_\_\_\_\_. b) x(n)/aa) x(n/a)c)  $a^n x(n)$ d) ax(n)11) The discrete time signal  $x(n) = (-1)^n$  is periodic with fundamental period. b) 4 6 a) c) 2 d) 0 12) Periodic signals are \_\_\_\_\_. b) x(t - T) = x(t)a)  $\mathbf{x}(\mathbf{t} + \mathbf{T}) = \mathbf{x}(\mathbf{t})$ x(n + mN) = x(n)d) All above C) A useful property of the unit impulse  $\delta$  (t) is that \_\_\_\_ 13) \_\_\_\_-. b)  $\delta(at) = \delta(t)$ a) δ(at)  $\delta(at) = \frac{1}{a}\delta(t)$ d)  $\delta(at) = [\delta(t)]^a$ c) 14) If signal f(t) has energy, E, the energy of signal f(2t) is equal to \_\_\_\_\_.

- a) E b) E/2
- c) 2E d) 4E

#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### Section – I

#### Q.2 Attempt any four of the following questions.

Find even and odd components of the following signals. a)

- 1)  $x(t) = 1 + t + 3t^{2} + 5t^{3} + 9t^{4}$ 2)  $x(t) = 1 + t\cos(t) + t^{2}\sin(t) + t^{3}\sin(t)\cos(t)$
- Explain operations performed on independent variables. b)
- Determine whether the following signal is periodic or non-periodic. If c) periodic find its fundamental period. 1)  $sin^{3}(2t)$
- Explain properties of LTI Systems. d)
- Draw Direct form-I and Direct form-II implementation for the following LTI e) system.

$$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$$

#### Q.3 Attempt any Two of the following questions.

Verify the general property of system for the following system. a)

$$\frac{d}{dt}y(t) + ty(t) = x(t)$$

- 1) Find the step response of the following system h(t) = t u(t). Justify also b) whether LTI system is stable or not stable.
  - State and prove the properties of convolution integral. 2)
- Perform the convolution operation of two function in time domain. C)
  - $h(t) = e^{-2t} u(t)$  and  $x(t) = e^{-t} u(t)$

#### Section – II

#### Q.4 Attempt any four of the following questions.

- State & explain sampling theorem. a)
- Explain modulation property of FT. b)
- Find ZT & sketch ROC c)
- $x(n) = (0.6)^n u(n) + (0.4)^n u(n)$
- d)
- Find ZT of x(n) = u(n + 1)u(n)Find inverse ZT of  $X(Z) = \frac{z}{2z^2-3z+1}$  & ROC is |Z| > 1e)

#### Attempt any Two of the following questions. Q.5

- Consider analog signal  $x(t) = 3 \cos 2000\pi t + 5 \sin 6000\pi t + 10 \cos 1000\pi t$ . a) What is sampling rate? i)
  - For this signal assuming that signal is sampled using fs=5000Hz. ii) What is DT signal?
- Determine FT of  $x(t) = e^{-a|t|}$  & plot magnitude spectrum. b)
- Find ZT of  $x(n) = n^2 u(n)$ C)

Max. Marks: 56

12

16

12

16



Seat No.

+ mN) = x(n)	d)	All above
property of the unit impulse	δ (t	) is that
)	b)	$\delta(at) = \delta(t)$
$\theta = \frac{1}{a}\delta(t)$	d)	$\delta(at) = [\delta(t)]^a$
(t) has energy , E, the ener	gy o b) d)	f signal f(2t) is equal to E/2 4E

**Duration: 30 Minutes** Choose the correct alternatives given below and rewrite the sentence. Inverse FT of 1 is \_\_\_\_\_. u(t) b)  $\partial(t)$ a) d) Infinite C) 0 function x(t) has only finite number of maxima & minima function x(t) has finite number of discontinuities function x(t) is absolutely integrable over one period b) Zeros d) No zeros b) |Z| > 1d) |Z| = 0

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#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Q.1

1)

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**

2) Dirichlet conditions for periodic signals are in each period. a) b) C) d) All of above 3) ROC of x(n) contains \_\_\_\_\_. a) Poles c) No poles 4) ROC of ZT of unit step seq is \_\_\_\_\_ a) |Z| < 1c) Real part of Z > 0Inverse ZT of X(Z/a) \_\_\_\_\_. 5) b) x(n)/aa) x(n/a)C)  $a^n x(n)$ d) ax(n)The discrete time signal  $x(n) = (-1)^n$  is periodic with fundamental period. 6) a) 6 b) 4 2 C) d) 0 Periodic signals are \_\_\_\_\_. 7) b) x(t - T) = x(t)x(t + T) = x(t)a) x(n +c) A useful p 8) a) δ(at) C)  $\delta(at)$ 9) If signal f( Е a) 2E c)

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Max. Marks: 70



Marks: 14

Set S

10)	A given system is characterized by the differential equation : $\frac{d^2y(t)}{dt^2} - \frac{dt(t)}{dt} - 2y(t) = x(t)$ The system is.				
	<ul> <li>a) Linear and unstable</li> <li>c) Nonlinear and unstable</li> </ul>	b) d)	Linear and stable Nonlinear and stable		
11)	The system characterized by the eq a) Linear for any value of b c) Linear if b<0	juatio b) d)	on $y(t) = ax(t) + b$ Linear if b>0 Non linear		
12)	If $h(n) = [\delta(n-l) - \delta(n)]^* \delta(n-1)^*$ a) $h(n) = [\delta(n) - \delta(n-1)]$ c) $h(n) = [\delta(n+1) - \delta(n-1)]$	then b) d)	alternatively written as $h(n) = [\delta(n-1) - \delta(n)]$ None		
13)	The frequency of a continuous time from $x(t)$ to $x(\alpha t)$ , $\alpha > 1$ by a factor _ a) $\alpha$ c) $\alpha^2$	sign b) d)	al x(t) changes on transformation $\frac{1}{\alpha}$ . None		
14)	Fourier spectrum (transform) of non a) Magnitude spectrum c) Both a & b	-per b) d)	iods signal will have Phase spectrum Constant value		

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#### S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SIGNALS AND SYSTEMS

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

#### Section – I

### Q.2 Attempt any four of the following questions.

Find even and odd components of the following signals. a)

- 1)  $x(t) = 1 + t + 3t^{2} + 5t^{3} + 9t^{4}$ 2)  $x(t) = 1 + t\cos(t) + t^{2}\sin(t) + t^{3}\sin(t)\cos(t)$
- Explain operations performed on independent variables. b)
- Determine whether the following signal is periodic or non-periodic. If c) periodic find its fundamental period. 1)  $sin^{3}(2t)$
- Explain properties of LTI Systems. d)
- Draw Direct form-I and Direct form-II implementation for the following LTI e) system.

$$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$$

## Q.3 Attempt any Two of the following questions.

Verify the general property of system for the following system. a) Ы

$$\frac{d}{dt}y(t) + ty(t) = x(t)$$

- 1) Find the step response of the following system h(t) = t u(t). Justify also b) whether LTI system is stable or not stable.
  - State and prove the properties of convolution integral. 2)
- Perform the convolution operation of two function in time domain. c)
  - $h(t) = e^{-2t} u(t)$  and  $x(t) = e^{-t} u(t)$

### Section – II

## Q.4 Attempt any four of the following questions.

- State & explain sampling theorem. a)
- Explain modulation property of FT. b)
- Find ZT & sketch ROC c)
- $x(n) = (0.6)^n u(n) + (0.4)^n u(n)$
- d)
- Find ZT of x(n) = u(n + 1)u(n)Find inverse ZT of  $X(Z) = \frac{z}{2z^2-3z+1}$  & ROC is |Z| > 1e)

#### Attempt any Two of the following questions. Q.5

- Consider analog signal  $x(t) = 3 \cos 2000\pi t + 5 \sin 6000\pi t + 10 \cos 1000\pi t$ . a) What is sampling rate? i)
  - For this signal assuming that signal is sampled using fs=5000Hz. ii) What is DT signal?
- Determine FT of  $x(t) = e^{-a|t|}$  & plot magnitude spectrum. b)
- Find ZT of  $x(n) = n^2 u(n)$ C)

16

12

Max. Marks: 56

16

# T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering**

Day & Date: Friday, 06-12-2019 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.
- 3) Figure must be draw wherever necessary.

#### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

C)

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

- A field line and an equipotential surface are 1) always parallel a)
  - b) always at 90° d) none of the above inclined at any angle C)
- Which of the following is true for electrostatics? 2) a)  $E = \nabla U$ b)  $\nabla^2 v = 0$

	a)	$E = -\nabla V$	D)	$\mathbf{v} \ \mathbf{v} = 0$
c) Both (a) and (b) d) None of these	c)	Both (a) and (b)	d)	None of these

- Potential energy of a test charge, when moved from a lower potential point 3) to a higher potential point
  - Remains the same a) b) Increases
  - Decreases c) d) Becomes zero
- As per Gauss's Law, the total electric flux  $\Psi$  through a closed surface and 4) the total charge Q<sub>en</sub> that surface are related as \_\_\_\_\_.
  - $\oint D.ds = Q$ b)  $\Psi = Q_{en}$ a)  $\oint D.\,ds = 0$ Both a & b d)
  - c)

The capacitance of isolated capacitor is \_ 5)  $4\pi\epsilon$ 

- a)  $4\pi\varepsilon_0\varepsilon_r a$ b) 1 1 b
- d) None of these c)  $4\pi\varepsilon_0\varepsilon_r(a-b)$
- 6)  $dv = r^2 \sin \theta \ dr d\Phi dz$  is the different volume in \_ Cylindrical co-ordinate system b) Spherical co-ordinate system a)
  - Cartesian co-ordinate system d) None of the above
- Statement 1: Potential is the gradient of electric field intensity. 7) Statement 2: Electric field intensity is opposite to the direction in which V is increases.
  - Statement 1 & Statement 2 are respectively.
  - True. False b) True. True a) C) False, True d) False, False

Seat No.

**ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM** 

Max. Marks: 70

Marks: 14



Set P

8)	<ul> <li>Directivity is</li> <li>a) Inversely proportional to beamwidth</li> <li>b) Inversely proportional to square of beamwidth</li> <li>c) directly proportional to beamwidth</li> <li>d) directly proportional to square of beamwidth</li> </ul>					
9)	The a) c)	unit of permeability is Henry/m Henry	b) d)	Farad/ m Webber		
10)	The a) c)	length of mobile antenna is $\lambda$ $\lambda/4$	b) d)	$\lambda/2 > \lambda$		
11)	For a) c)	plane waves, the angle between 90° 0°	eleo b) d)	ctric and magnetic field is 180° 720°		
12)	Unit a) c)	of magnetic flux density is V/m C/m <sup>2</sup>	b) d)	m/ V Tesla		
13)	The a) c)	wavelength of a 10GHz plane w 300m 3mm	ave b) d)	is 300mm 30mm		
14)	The a) c)	ration of the magnitude of electr resistance conductance	ic & b) d)	magnetic fields is termed as Admittance Impedance		

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever necessary.

#### Section – I

#### Q.2 Solve Any Three.

Seat

No.

- a) State and prove Gauss Theorem?
- **b)** Determine the work done to carry  $2\mu$ C charge from P1 (2, 1, -1) to P2 (8, 2, -1) in the field
  - E=y  $a_x$ +x $a_y$  along path x=2 $y^2$ .
- **c)** Given the potential  $V = \frac{10}{r^2} \sin \theta \cos \phi$  find D at  $(2, \pi/2, 0)$ .
- d) Let  $a = 120 \text{ cm}^2$ , d = 5 mm and  $\varepsilon_r = 12$  for parallel plate capacitor.
  - 1) Calculate the capacitance.
  - 2) If Vo=40 V find E & stored energy.
- e) Explain coulombs law and its vector form?

#### Q.3 Solve Any Two

- a) Find the work done in moving a point charge
  - $Q = 5 \,\mu C$  from (0,0,0) to (2,  $\pi/4$ ,  $\pi/2$ ) in the field.

$$E = 5e^{-r/4}a_r + \frac{10}{r\sin\theta} a_{\Phi} v/m.$$

- b) Derive expression on electric field due to infinite sheet charge?
- c) State & Prove Divergence theorem?

 $D = yxz a_x - y^2 a_y + yz a_z$ . Evaluate Divergence Theorem of both side of unit cube  $0 \le x, y, z \le 1$ .

#### Section – II

#### Q.4 Solve any four

- a) What do you mean by field zones of antenna? Elaborate the concept with neat sketch.
- b) Find the contribution to the magnetic flux density at point P caused by Semicircle section, two horizontal sections and one vertical section of the conductors. I = 6A.



SLR-FM-685

5

Set

Max. Marks: 56

16

12

Set P

- c) Derive Helmholtz wave equations for electromagnetic waves.
- d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

 $E = 2 sinx.sint.a_y$ 

- $H = (2/\mu)\cos x \cdot \cos t \cdot a_z$
- e) What is Radiation resistance of antenna? Explain any five properties of antenna.

#### Q.5 Attempt any two

- a) Explain with suitable derivation, the Maxwell's equations in Time varying fields.
- **b)** Derive Pointing Theorem and give its physical interpretation.
- c) Differentiate Yagi array, broad side array and end fire array with their properties.

# Set

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-12-2019 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) Assume suitable data if necessary.
- 3) Figure must be draw wherever necessary.

#### **MCQ/Objective Type Questions**

Duration: 30 I	Vinutes
----------------	---------

- Choose the correct alternatives from the options and rewrite the sentence. 14 Q.1
  - Directivity is 1)
    - Inversely proportional to beamwidth a)
    - Inversely proportional to square of beamwidth b)
    - directly proportional to beamwidth C)
    - directly proportional to square of beamwidth d)
  - The unit of permeability is \_\_\_\_\_ 2) b) Farad/m Henry/m a) Henry d) Webber c) The length of mobile antenna is 3) b)  $\lambda/2$ a) λ
    - c)  $\lambda/4$ d)  $> \lambda$
  - For plane waves, the angle between electric and magnetic field is \_\_\_\_\_. 4)
    - 90° a) b) 180° 0° d) 720° C)
  - Unit of magnetic flux density is \_\_\_\_\_ 5)
    - b) m/V V/m a)  $C/m^2$ C) d) Tesla

The wavelength of a 10GHz plane wave is 6) 300m b) 300mm a)

3mm d) 30mm C)

The ration of the magnitude of electric & magnetic fields is termed as \_\_\_\_\_. 7)

- a) resistance b) Admittance d) Impedance conductance c)
- 8) A field line and an equipotential surface are \_\_\_\_\_
  - b) always at 90° always parallel a)
- inclined at any angle d) none of the above c)
- Which of the following is true for electrostatics? 9)
  - $E = -\nabla V$ b)  $\nabla^2 V = 0$ a) Both (a) and (b) d) None of these c)
- Potential energy of a test charge, when moved from a lower potential point 10) to a higher potential point \_\_\_\_

b) Increases

- Remains the same a)
- Decreases d) Becomes zero c)

Max. Marks: 70

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Marks: 14



- As per Gauss's Law, the total electric flux  $\Psi$  through a closed surface and 11) the total charge Q<sub>en</sub> that surface are related as \_\_\_\_\_.
  - $\oint D.ds = Q$ b)  $\Psi = Q_{en}$ a) d)  $\oint D.\,ds = 0$ c) Both a & b

12) The capacitance of isolated capacitor is

> 4πε a)  $4\pi\varepsilon_0\varepsilon_r a$ b) 1 1

c) 
$$4\pi\varepsilon_0\varepsilon_r(a-b)$$
 d)

13) 
$$dv = r^2 \sin \theta \ dr d\Phi dz$$
 is the different volume in \_

Cylindrical co-ordinate system b) Spherical co-ordinate system

b a

None of these

- Cartesian co-ordinate system d) None of the above C)
- 14) Statement 1: Potential is the gradient of electric field intensity. Statement 2: Electric field intensity is opposite to the direction in which V is increases.

Statement 1 & Statement 2 are respectively.

a) True, False

a)

b) True, True d) False, False c) False, True

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever necessary.

### Section – I

#### Q.2 Solve Any Three.

- State and prove Gauss Theorem? a)
- b) Determine the work done to carry - 2µC charge from P1 (2, 1, -1) to P2 (8, 2. -1) in the field
  - $E=y a_x+xa_y$  along path  $x=2y^2$ .
- Given the potential V =  $\frac{10}{r^2} \sin \theta \cos \phi$  find D at (2,  $\pi/2$ , 0). C)
- Let  $a= 120 \text{ cm}^2$ , d= 5 mm and  $\varepsilon_r = 12$  for parallel plate capacitor. d)
  - 1) Calculate the capacitance.
  - 2) If Vo=40 V find E & stored energy.
- Explain coulombs law and its vector form? e)

#### Solve Any Two Q.3

- a) Find the work done in moving a point charge
  - $Q = 5 \,\mu C$  from (0,0,0) to (2,  $\pi/4$ ,  $\pi/2$ ) in the field.

$$E = 5e^{-r/4}a_r + \frac{10}{r\sin\theta} a_{\Phi} v/m$$

- Derive expression on electric field due to infinite sheet charge? b)
- State & Prove Divergence theorem? c)

 $D = yxz a_x - y^2 a_y + yz a_z$ . Evaluate Divergence Theorem of both side of unit cube  $0 \le x, y, z \le 1$ .

### Section - II

#### Solve any four Q.4

- What do you mean by field zones of antenna? Elaborate the concept with a) neat sketch.
- Find the contribution to the magnetic flux density at point P caused by b) Semicircle section, two horizontal sections and one vertical section of the conductors. I = 6A.



Max. Marks: 56

16

12

16

Set

**SLR-FM-685** 

Seat No.



Set Q

- c) Derive Helmholtz wave equations for electromagnetic waves.
- d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

 $E = 2 sinx.sint.a_y$ 

- $H = (2/\mu)\cos x \cdot \cos t \cdot a_z$
- e) What is Radiation resistance of antenna? Explain any five properties of antenna.

#### Q.5 Attempt any two

- a) Explain with suitable derivation, the Maxwell's equations in Time varying fields.
- **b)** Derive Pointing Theorem and give its physical interpretation.
- c) Differentiate Yagi array, broad side array and end fire array with their properties.

## Set T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM**

Day & Date: Friday, 06-12-2019 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.
- 3) Figure must be draw wherever necessary.

#### **MCQ/Objective Type Questions**

#### **Duration: 30 Minutes**

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

d)

1) The capacitance of isolated capacitor is 4πε

a)	$4\pi\varepsilon_0\varepsilon_r a$	b)	1

c) $4\pi\varepsilon_0\varepsilon_r(a-b)$	
--	--

2)	<i>dv</i> = a) c)	$= r^2 \sin \theta \ dr d\Phi dz$ is the different Cylindrical co-ordinate system Cartesian co-ordinate system	t volu b) d)	ume in Spherical co-ordinate system None of the above
3)	Stat Stat incr Stat a) c)	tement 1: Potential is the gradier tement 2: Electric field intensity is eases. tement 1 & Statement 2 are resp True, False False. True	nt of s opp ectiv b) d)	electric field intensity. posite to the direction in which V is rely. True, True False. False
4)	Dire a) b) c) d)	ectivity is Inversely proportional to beamy Inversely proportional to square directly proportional to beamwic directly proportional to square o	vidth e of t dth of be	beamwidth amwidth
5)	The a) c)	unit of permeability is Henry/m Henry	b) d)	Farad/ m Webber
6)	The a) c)	length of mobile antenna is $\lambda$ $\lambda/4$	b) d)	$\lambda/2 > \lambda$
7)	For a) c)	plane waves, the angle between 90° 0°	b) d)	ctric and magnetic field is 180° 720°
8)	Unit a) c)	t of magnetic flux density is V/m C/m <sup>2</sup>	b) d)	m/ V Tesla

Max. Marks: 70

**SLR-FM-685** 

## Seat No.

Marks: 14

1 b None of these

Set | R

- 9) The wavelength of a 10GHz plane wave is \_\_\_\_\_
  - 300m a)

C)

3mm

- b) 300mm
  - d) 30mm
- The ration of the magnitude of electric & magnetic fields is termed as \_\_\_\_\_. 10)
  - resistance a)
  - c) conductance
- 11) A field line and an equipotential surface are \_\_\_\_\_
  - always parallel a)
  - inclined at any angle C)
- Which of the following is true for electrostatics? 12)
  - $E = -\nabla V$ b)  $\nabla^2 V = 0$ a)
  - c) Both (a) and (b)
- Potential energy of a test charge, when moved from a lower potential point 13) to a higher potential point \_\_\_\_
  - a) Remains the same b) Increases
  - Decreases d) Becomes zero C)
- As per Gauss's Law, the total electric flux  $\Psi$  through a closed surface and 14) the total charge Q<sub>en</sub> that surface are related as \_\_\_\_\_.
  - $\oint D.\,ds = Q$ a)
  - Both a & b C)

Page 10 of 16

- b) Admittance
- d) Impedance
- b) always at 90°
- d) none of the above

- d) None of these

- b)  $\Psi = Q_{en}$ 
  - d)  $\oint D.\,ds = 0$

## Seat No.

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever necessary.

#### Section – I

#### Q.2 Solve Any Three.

- a) State and prove Gauss Theorem?
- **b)** Determine the work done to carry  $2\mu$ C charge from P1 (2, 1, -1) to P2 (8, 2, -1) in the field
  - E=y  $a_x$ +x $a_y$  along path x=2y<sup>2</sup>.
- **c)** Given the potential  $V = \frac{10}{r^2} \sin \theta \cos \phi$  find D at  $(2, \pi/2, 0)$ .
- d) Let  $a = 120 \text{ cm}^2$ , d = 5 mm and  $\varepsilon_r = 12$  for parallel plate capacitor.
  - 1) Calculate the capacitance.
  - 2) If Vo=40 V find E & stored energy.
- e) Explain coulombs law and its vector form?

#### Q.3 Solve Any Two

- a) Find the work done in moving a point charge
  - $Q = 5 \,\mu C$  from (0,0,0) to (2,  $\pi/4$ ,  $\pi/2$ ) in the field.

$$E = 5e^{-r/4}a_r + \frac{10}{r\sin\theta} a_{\Phi} v/m.$$

- b) Derive expression on electric field due to infinite sheet charge?
- c) State & Prove Divergence theorem?

 $D = yxz a_x - y^2 a_y + yz a_z$ . Evaluate Divergence Theorem of both side of unit cube  $0 \le x, y, z \le 1$ .

#### Section – II

### Q.4 Solve any four

- a) What do you mean by field zones of antenna? Elaborate the concept with neat sketch.
- b) Find the contribution to the magnetic flux density at point P caused by Semicircle section, two horizontal sections and one vertical section of the conductors. I = 6A.



Max. Marks: 56

16

12

16

# SLR-FM-685 Set R

Set R

- c) Derive Helmholtz wave equations for electromagnetic waves.
- d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

 $E = 2 sinx.sint.a_y$ 

- $H = (2/\mu)\cos x \cdot \cos t \cdot a_z$
- e) What is Radiation resistance of antenna? Explain any five properties of antenna.

#### Q.5 Attempt any two

- a) Explain with suitable derivation, the Maxwell's equations in Time varying fields.
- **b)** Derive Pointing Theorem and give its physical interpretation.
- c) Differentiate Yagi array, broad side array and end fire array with their properties.

		<ol> <li>Assume suitable data if necessary.</li> <li>Figure must be draw wherever necessary.</li> </ol>	
		MCQ/Objective Type Questions	
Dura	ation: (	30 Minutes	Marks: 14
Q.1	<b>Cho</b> 1)	bose the correct alternatives from the options andThe length of mobile antenna isa) $\lambda$ b) $\lambda/2$ c) $\lambda/4$ d) $> \lambda$	I rewrite the sentence. 14
	2)	For plane waves, the angle between electric and maa) 90°b) 180°c) 0°d) 720°	agnetic field is
	3)	Unit of magnetic flux density is a) V/m b) m/ V c) C/m <sup>2</sup> d) Tesla	
	4)	The wavelength of a 10GHz plane wave is a) 300m b) 300mm c) 3mm d) 30mm	
	5)	The ration of the magnitude of electric & magnetic fa) resistanceb) Admittancc) conductanced) Impedance	ields is termed as e e
	6)	A field line and an equipotential surface are a) always parallel b) always at c) inclined at any angle d) none of th	 90° e above
	7)	Which of the following is true for electrostatics?a) $E = -\nabla V$ b) $\nabla^2 V = 0$ c) Both (a) and (b)d) None of the	nese
	8)	Potential energy of a test charge, when moved from to a higher potential pointa) Remains the sameb) Increasesc) Decreasesd) Becomes	a lower potential point zero
	9)	As per Gauss's Law, the total electric flux $\Psi$ through the total charge $Q_{en}$ that surface are related as	n a closed surface and
		a) $\oint D.ds = Q$ b) $\Psi = Q_{en}$	

d)  $\oint D.\,ds = 0$ 

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

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

Day & Date: Friday, 06-12-2019 Time: 02:30 PM To 05:30 PM

book.

Both a & b

C)

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Set

Max. Marks: 70

Set S

- 10) The capacitance of isolated capacitor is
  - $4\pi\epsilon$ a)  $4\pi\varepsilon_0\varepsilon_r a$ b) 1 1
  - a b c)  $4\pi\varepsilon_0\varepsilon_r(a-b)$ d) None of these
- $dv = r^2 \sin \theta \ dr d\Phi dz$  is the different volume in \_ 11)

b) Farad/m

- a) Cylindrical co-ordinate systemb) Spherical co-ordinate systemc) Cartesian co-ordinate systemd) None of the above
- Statement 1: Potential is the gradient of electric field intensity. 12) Statement 2: Electric field intensity is opposite to the direction in which V is increases.
  - Statement 1 & Statement 2 are respectively.
  - a) True, False b) True, True
  - c) False, True d) False, False
- 13) Directivity is \_\_\_
  - Inversely proportional to beamwidth a)
  - Inversely proportional to square of beamwidth b)
  - directly proportional to beamwidth c)
  - directly proportional to square of beamwidth d)
- The unit of permeability is \_\_\_\_\_ 14)
  - Henry/m a)
  - C) Henry d) Webber

# Seat No.

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019

Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figure to the right indicates full marks.
- 3) Assume suitable data wherever necessary.

#### Section – I

#### Q.2 Solve Any Three.

- a) State and prove Gauss Theorem?
- **b)** Determine the work done to carry  $2\mu$ C charge from P1 (2, 1, -1) to P2 (8, 2, -1) in the field
  - E=y  $a_x$ +x $a_y$  along path x=2y<sup>2</sup>.
- **c)** Given the potential  $V = \frac{10}{r^2} \sin \theta \cos \phi$  find D at  $(2, \pi/2, 0)$ .
- d) Let  $a = 120 \text{ cm}^2$ , d = 5 mm and  $\varepsilon_r = 12$  for parallel plate capacitor.
  - 1) Calculate the capacitance.
  - 2) If Vo=40 V find E & stored energy.
- e) Explain coulombs law and its vector form?

#### Q.3 Solve Any Two

- a) Find the work done in moving a point charge
  - $Q = 5 \,\mu C$  from (0,0,0) to (2,  $\pi/4$ ,  $\pi/2$ ) in the field.

$$E = 5e^{-r/4}a_r + \frac{10}{r\sin\theta} a_{\Phi} v/m.$$

- b) Derive expression on electric field due to infinite sheet charge?
- c) State & Prove Divergence theorem?  $D = vrz a = v^2 a \pm vrz a$  Evaluate Divergence

 $D = yxz a_x - y^2 a_y + yz a_z$ . Evaluate Divergence Theorem of both side of unit cube  $0 \le x, y, z \le 1$ .

### Section – II

## Q.4 Solve any four

- a) What do you mean by field zones of antenna? Elaborate the concept with neat sketch.
- b) Find the contribution to the magnetic flux density at point P caused by Semicircle section, two horizontal sections and one vertical section of the conductors. I = 6A.



Max. Marks: 56

Set

**SLR-FM-685** 

16

12

Set S

- c) Derive Helmholtz wave equations for electromagnetic waves.
- d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

 $E = 2 sinx.sint.a_y$ 

- $H = (2/\mu)\cos x \cdot \cos t \cdot a_z$
- e) What is Radiation resistance of antenna? Explain any five properties of antenna.

#### Q.5 Attempt any two

- a) Explain with suitable derivation, the Maxwell's equations in Time varying fields.
- **b)** Derive Pointing Theorem and give its physical interpretation.
- c) Differentiate Yagi array, broad side array and end fire array with their properties.

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 and rewrite the sentence. 14
  - The capacity of communication channel with bandwidth of 5MHz and 1) 15SNR is approximately \_\_\_\_
    - a) 10Mbps
    - c) 75Mbps d) 150Mbps
  - 2) A source delivers symbols m1, m2, m3, m4 with probabilities 1/4, 1/4, 1/4, 1/4 respectively. The entropy of the system is \_
    - a) 2 bits/sec b) 2 bits/symbols
    - c) 2 symbols d) 2 symbol/bit
  - 3) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation
    - a) True b) False
  - 4) In a pulse code modulation (PCM) the information is transmitted in the form of
    - a) variation in the amplitude of pulses
    - b) variation in the width of pulses
    - c) variation in the position of pulses
    - d) code word each of N bit length
  - The non uniform quantization leads to 5)
    - a) reduction in transmission bandwidth
    - b) increase in maximum SNR
    - c) increase in SNR for low level signals
    - d) simplification of quantization process
  - encoding, we use three levels: positive, zero and negative. In 6) a) unipolar
    - b) Bipolar
    - d) none of the above c) polar
  - The process of correcting channel induced distortion is called \_\_\_\_\_. 7)
    - a) ISI b) matched filter
    - c) correlation receiver d) Equalization
  - In MSK, the difference between the higher and lower frequency is \_\_\_\_\_. 8)
    - a) Same as the bit rate Twice of the bit rate

c)

b) Half of the bit rate d) Four time the bit rate Set Ρ





- 20Mbps

b)



Max. Marks: 70

Marks: 14

 In multichannel digital communication in AWGN channels are fixed but vary in \_\_\_\_\_.

- a) magnitude and phase
- b) magnitude and frequency

**SLR-FM-686** 

Set

- c) frequency and phase
- d) none
- 10) The correlation receiver consist of \_\_\_\_\_.
  - a) a multiplier and integrator
  - b) an adder and an integrator
  - c) a multiplier and a differentiation
  - d) an adder and a differentiator

11) QPSK is a modulation scheme where each symbol consists of \_\_\_\_\_.

- a) 4 bits
- b) 2 bits
- c) 1 bits
- d) M number of bits, depending upon the requirement
- 12) In Binary FSK, mark and space respectively represent.
  - a) 1 and 0 b) 0 and 1
  - c) 11 and 00 d) 00 and 11
- 13) Minimum shift keying is similar to \_\_\_\_\_
  - a) Continuous phase frequency shift keying
  - b) Binary phase shift keying
  - c) Binary frequency shift keying
  - d) QPSK
- 14) Advantages of digital communication are \_\_\_\_
  - a) Easy multiplexing
- b) Easy processing

c) Reliable

d) All of the mentioned

Set

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019

Time: 02:30 PM To 05:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section - I

#### Q.2 Solve any four of the questions.

- a) With the help of block diagram explain the working of Delta Modulation. What are its drawbacks?
- **b)** With the waveforms explain how PPM is derived from PAM.
- c) Write a note on intersymbol interference.
- **d)** An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of ¼, 1/5, 1/5, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Find the entropy and the rate of information.
- e) Explain working of adaptive Equalizer.

#### Q.3 Solve any two of the following.

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M=4.

[X]=[x1	x2	x3	x4	x5	x6	x7	x8]
[P]=[0.2	0.2	0.15	0.15	0.1	0.1	0.05	0.05]

- b) Explain any one method of symbol synchronization in detail.
- c) With the block diagram explain PCM-TDM Telephone system.

#### Section - II

#### Q.4 Solve any four of the followings.

- a) With block diagram explain non-coherent FSK.
- b) List out advantages of multicarrier communication system
- c) Explain Differential coherent PSK.
- d) Write a note on wideband FSK in short.
- e) Write a note on M-ary orthogonal signals.

### Q.5 Solve any two of the following.

- a) Write a note on QAM in detail.
- **b)** Explain multichannel digital communication in AWGN channels.
- c) Explain the matched filter receiver in detail.

Max. Marks: 56

12

16

16

Seat No.

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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** 

c)

c)

Marks: 14

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

- 1) In MSK, the difference between the higher and lower frequency is \_\_\_\_\_.
  - a) Same as the bit rate
- b) Half of the bit rate
- d) Four time the bit rate
- 2) In multichannel digital communication in AWGN channels are fixed but vary in \_\_\_
  - a) magnitude and phase

Twice of the bit rate

- b) magnitude and frequency
- frequency and phase
  - d) none
- The correlation receiver consist of \_\_\_\_\_. 3)
  - a multiplier and integrator a)
  - an adder and an integrator b)
  - a multiplier and a differentiation C)
  - an adder and a differentiator d)

QPSK is a modulation scheme where each symbol consists of \_\_\_\_\_.

- 4 bits a)
- 2 bits b)
- 1 bits c)
- d) M number of bits, depending upon the requirement
- In Binary FSK, mark and space respectively represent. 5)
  - a) 1 and 0 b) 0 and 1 11 and 00 c)
    - d) 00 and 11
- 6) Minimum shift keying is similar to
  - Continuous phase frequency shift keying a)
  - b) Binary phase shift keying
  - Binary frequency shift keying C)
  - **QPSK** d)

a)

c)

- Advantages of digital communication are \_\_\_\_\_
  - Easy multiplexing b) Easy processing
    - d) All of the mentioned
- The capacity of communication channel with bandwidth of 5MHz and 8) 15SNR is approximately \_\_\_\_\_.
  - a) 10Mbps

Reliable

- c) 75Mbps
- 20Mbps b)
- d) 150Mbps

Set

Max. Marks: 70

- 9) A source delivers symbols m1, m2, m3, m4 with probabilities 1/4, 1/4, 1/4, 1/4, 1/4 respectively. The entropy of the system is \_\_\_\_\_.
  - a) 2 bits/sec

c) 2 symbols

b) 2 bits/symbols

**SLR-FM-686** 

Set | Q

- d) 2 symbol/bit
- 10) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation \_\_\_\_\_.
  - a) True b) False
- 11) In a pulse code modulation (PCM) the information is transmitted in the form of \_\_\_\_\_.
  - a) variation in the amplitude of pulses
  - b) variation in the width of pulses
  - c) variation in the position of pulses
  - d) code word each of N bit length
- 12) The non uniform quantization leads to \_\_\_\_\_
  - a) reduction in transmission bandwidth
  - b) increase in maximum SNR
  - c) increase in SNR for low level signals
  - d) simplification of quantization process
- 13) In \_\_\_\_\_ encoding, we use three levels: positive, zero and negative.
  - a) unipolar

polar

- b) Bipolard) none of the above
- 14) The process of correcting channel induced distortion is called \_\_\_\_\_.
  - a) ISI

C)

- b) matched filter
- c) correlation receiver
- d) Equalization

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any four of the questions.

- a) With the help of block diagram explain the working of Delta Modulation. What are its drawbacks?
- **b)** With the waveforms explain how PPM is derived from PAM.
- c) Write a note on intersymbol interference.
- d) An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of 1/4, 1/5, 1/10, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Find the entropy and the rate of information.
- e) Explain working of adaptive Equalizer.

#### Q.3 Solve any two of the following.

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M=4.

[X]=[x1	x2	x3	x4	x5	x6	x7	x8]
[P]=[0.2	0.2	0.15	0.15	0.1	0.1	0.05	0.05]

- **b)** Explain any one method of symbol synchronization in detail.
- c) With the block diagram explain PCM-TDM Telephone system.

### Section - II

- Q.4 Solve any four of the followings.
  a) With block diagram explain non-coherent FSK.
  b) List out advantages of multicarrier communication system
  c) Explain Differential coherent PSK.
  d) Write a note on wideband FSK in short.
  e) Write a note on M-ary orthogonal signals.
- Q.5 Solve any two of the following.
  - a) Write a note on QAM in detail.
  - **b)** Explain multichannel digital communication in AWGN channels.
  - c) Explain the matched filter receiver in detail.

)

Max. Marks: 56

Set

12

16

Seat No.

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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** 

Marks: 14

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

- The non uniform quantization leads to 1)
  - a) reduction in transmission bandwidth
  - b) increase in maximum SNR
  - increase in SNR for low level signals c)
  - d) simplification of quantization process
- 2) In \_ encoding, we use three levels: positive, zero and negative.
  - a) unipolar

c) polar

c)

b) Bipolar d) none of the above

The process of correcting channel induced distortion is called . 3)

- a) ISI c) correlation receiver
- b) matched filter d) Equalization
- 4) In MSK, the difference between the higher and lower frequency is \_\_\_\_\_.
  - a) Same as the bit rate Twice of the bit rate
- b) Half of the bit rate
- d) Four time the bit rate
- 5) In multichannel digital communication in AWGN channels are fixed but vary in
  - a) magnitude and phase
- b) magnitude and frequency
- c) frequency and phase d) none
- The correlation receiver consist of 6)
  - a) a multiplier and integrator
  - b) an adder and an integrator
  - a multiplier and a differentiation c)
  - d) an adder and a differentiator
- 7) QPSK is a modulation scheme where each symbol consists of .
  - a) 4 bits
  - b) 2 bits
  - 1 bits c)
  - d) M number of bits, depending upon the requirement
- 8) In Binary FSK, mark and space respectively represent.
  - 1 and 0 b) 0 and 1 a)
  - 11 and 00 d) 00 and 11 c)

Set R

Max. Marks: 70

9) Minimum shift keying is similar to \_\_\_\_\_.

- a) Continuous phase frequency shift keying
- b) Binary phase shift keying
- c) Binary frequency shift keying
- d) QPSK

a) 10Mbps

- 10) Advantages of digital communication are \_\_\_\_\_.
  - a) Easy multiplexing b) Easy processing
    - c) Reliable d) All of the mentioned
- 11) The capacity of communication channel with bandwidth of 5MHz and 15SNR is approximately \_\_\_\_\_.
  - b) 20Mbps
  - c) 75Mbps d) 150Mbps
- 12) A source delivers symbols m1, m2, m3, m4 with probabilities 1/4, 1/4, 1/4, 1/4, 1/4 respectively. The entropy of the system is \_\_\_\_\_.
  - a) 2 bits/sec b) 2 bits/symbols
  - c) 2 symbols d) 2 symbol/bit
- 13) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation \_\_\_\_\_\_.
   a) True
  - a) True b) False
- 14) In a pulse code modulation (PCM) the information is transmitted in the form of \_\_\_\_\_.
  - a) variation in the amplitude of pulses
  - b) variation in the width of pulses
  - c) variation in the position of pulses
  - d) code word each of N bit length

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Set R
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#### **SLR-FM-686**

## Set R

Max. Marks: 56

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

#### Q.2 Solve any four of the questions.

- a) With the help of block diagram explain the working of Delta Modulation. What are its drawbacks?
- **b)** With the waveforms explain how PPM is derived from PAM.
- c) Write a note on intersymbol interference.
- **d)** An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of 1/4, 1/5, 1/10, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Find the entropy and the rate of information.
- e) Explain working of adaptive Equalizer.

#### Q.3 Solve any two of the following.

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M=4.

[X]=[x1	x2	x3	x4	x5	x6	x7	x8]
[P]=[0.2	0.2	0.15	0.15	0.1	0.1	0.05	0.05]

- **b)** Explain any one method of symbol synchronization in detail.
- c) With the block diagram explain PCM-TDM Telephone system.

#### Section – II

- Q.4 Solve any four of the followings.
  - a) With block diagram explain non-coherent FSK.
  - b) List out advantages of multicarrier communication system
  - c) Explain Differential coherent PSK.
  - d) Write a note on wideband FSK in short.
  - e) Write a note on M-ary orthogonal signals.

#### Q.5 Solve any two of the following.

- a) Write a note on QAM in detail.
- **b)** Explain multichannel digital communication in AWGN channels.
- c) Explain the matched filter receiver in detail.

16

12

12

Set

Max. Marks: 70

Seat No.

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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** 

Marks: 14

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

- The correlation receiver consist of \_\_\_\_\_.
  - a) a multiplier and integrator
  - b) an adder and an integrator
  - c) a multiplier and a differentiation
  - d) an adder and a differentiator
- 2) QPSK is a modulation scheme where each symbol consists of \_\_\_\_\_.
  - a) 4 bits
  - b) 2 bits
  - c) 1 bits
  - d) M number of bits, depending upon the requirement
- 3) In Binary FSK, mark and space respectively represent.
  - a) 1 and 0 b) 0 and 1
  - c) 11 and 00 d) 00 and 11
- 4) Minimum shift keying is similar to \_\_\_\_\_
  - a) Continuous phase frequency shift keying
  - b) Binary phase shift keying
  - c) Binary frequency shift keying
  - d) QPSK
- 5) Advantages of digital communication are \_
  - a) Easy multiplexing b) Easy processing
  - c) Reliable d) All of the mentioned
- The capacity of communication channel with bandwidth of 5MHz and 15SNR is approximately \_\_\_\_\_.
  - a) 10Mbps b) 20Mbps
  - c) 75Mbps d) 150Mbps
- 7) A source delivers symbols m1, m2, m3, m4 with probabilities 1/4, 1/4, 1/4, 1/4, 1/4 respectively. The entropy of the system is \_\_\_\_\_.
  - a) 2 bits/sec b) 2 bits/symbols
  - c) 2 symbols d) 2 symbol/bit
- 8) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation \_\_\_\_\_.
  - a) True b) False

Page **10** of **12** 

- In a pulse code modulation (PCM) the information is transmitted in the form of \_\_\_\_\_.
  - a) variation in the amplitude of pulses
  - b) variation in the width of pulses
  - c) variation in the position of pulses
  - d) code word each of N bit length
- 10) The non uniform quantization leads to \_\_\_\_\_
  - a) reduction in transmission bandwidth
  - b) increase in maximum SNR
  - c) increase in SNR for low level signals
  - d) simplification of quantization process
- 11) In \_\_\_\_\_ encoding, we use three levels: positive, zero and negative.
  - a) unipolar

- b) Bipolar
- c) polar d) none of the above
- 12) The process of correcting channel induced distortion is called \_\_\_\_\_.
  - a) ISI
- b) matched filter
- c) correlation receiver
- d) Equalization
- 13) In MSK, the difference between the higher and lower frequency is
  - a) Same as the bit rate
- b) Half of the bit rate
- c) Twice of the bit rate d)
- d) Four time the bit rate

Set S

- 14) In multichannel digital communication in AWGN channels are fixed but vary in \_\_\_\_\_.
  - a) magnitude and phase
- b) magnitude and frequency
- c) frequency and phase
- d) none

16

### **SLR-FM-686**

Set

Max. Marks: 56

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

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

**Instructions:** 1) All questions are compulsory.

2) Figure to the right indicates full marks.

#### Section – I

### Q.2 Solve any four of the questions.

- a) With the help of block diagram explain the working of Delta Modulation. What are its drawbacks?
- **b)** With the waveforms explain how PPM is derived from PAM.
- c) Write a note on intersymbol interference.
- d) An analog signal bandlimited to 10KHz is quantized in 8 levels of PCM system with probabilities of ¼, 1/5, 1/5, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Find the entropy and the rate of information.
- e) Explain working of adaptive Equalizer.

#### Q.3 Solve any two of the following.

a) Apply Huffman Coding Procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M=4.

[X]=[x1	x2	x3	x4	x5	x6	x7	x8]
[P]=[0.2	0.2	0.15	0.15	0.1	0.1	0.05	0.05]

- **b)** Explain any one method of symbol synchronization in detail.
- c) With the block diagram explain PCM-TDM Telephone system.

#### Section - II

- Q.4 Solve any four of the followings.
  a) With block diagram explain non-coherent FSK.
  b) List out advantages of multicarrier communication system
  c) Explain Differential coherent PSK.
  d) Write a note on wideband FSK in short.
  e) Write a note on M-ary orthogonal signals.
- Q.5 Solve any two of the following.
  - a) Write a note on QAM in detail.
  - **b)** Explain multichannel digital communication in AWGN channels.
  - c) Explain the matched filter receiver in detail.

12

## Seat No.

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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 indicates full marks.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

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

- Cascade Arrangement is Present in 1)
  - a) Evolutionary Development b)
  - c) Waterfall Model
- 2) Functional Requirements considers
  - a) Output Security C)
- System testing involves \_\_\_\_\_. 3) Integration testing b) a)
  - Interface testing d) c)
- Behavioral Model is called as \_\_\_\_\_. 4)
  - Object Model b) Dataflow model a) Context Model d) V Model c)
- RUP having four phases in a sequence as \_\_\_\_\_. 5)
  - a) Inception- Collaboration-Transition Revision.
  - b) Inception- Elaboration -Construction-Transition.
  - c) Elaboration-Inception-Construction-Transition.
  - d) Transition-Inception- Elaboration -Construction

b)

d)

- 6) Dataflow Model & state machine model are types of \_ **Behavioral Model** a)
  - Context Model b)
  - c) Data Model All d)
- 7) Partition testing is part of \_\_\_\_\_.
  - a) Release testing
  - c) System testing
- 8) Test automation helps to \_\_\_\_\_.
  - a) Reduce the cost of testing
    - c) Reduce time of testing
- 9) CBSE Approach is based on \_\_\_\_
  - a) Existence of reusable components
  - b) Existence of new components
  - Nonexistence of components c)
  - d) None of above

- b) Increase the cost of testing
- d) Increase time of testing

Component testing Performance testing

- Incremental Delivery
- d) None
- d)
- Release testing
- Both a and b
- b) Input
- Input & output

Max. Marks: 70

Marks: 14

Set

10) Software Specification is process of \_\_\_\_\_.

- a) Understanding & defining service required
- b) Identifying the constraints on system
- c) Both a & b
- d) Identifying document
- 11) Scheduling can best be defined as the process used to determine \_\_\_\_\_.
  - a) overall project duration
- b) project cost estimating

Task

- c) the project management plan d)
- d) sub-contractor's responsibilities

**SLR-FM-687** 

Set

- 12) Risk is \_\_\_\_\_
  - a) Event which may arrive in future
  - b) Negative effect causing events
  - c) Problems arriving in project
  - d) All are correct

#### 13) The basic resource of the organization is \_

- a) Money b) Machines
- c) Manpower d) All of them
- 14) Framework of risk contains the categories as \_\_\_\_\_.
  - a) Actors b)
  - c) Structure and technology d) All

No.						Set	Υ
T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM							
Day & Time	Day & Date: Wednesday, 11-12-2019 Max. Mark Time: 02:30 PM To 05:30 PM					Max. Marks	s: 56
Instr	Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.						
			S	ection – I			
Q.2	Solv a) b) c) d) e)	<b>ve any three.</b> Explain Software Explain Test Auto Explain in detail S Compare: V Mod List & Explain ch	E Life Cycle con omation. System Testin lel with Prototy ar. of Software	ncept. g. /ping Model. e Process.			12
Q.3	Solv a) b) c) d)	<b>ve any two.</b> Write note on RL List types of non- requirement. List System Mod Compare Functio	JP with Diagra -functional req els & explain a onal Requirem	m & Phases. uirement. Exp any one of the ent with Nonf	olain general struc m. unctional Require	ture of ment.	16
			Sec	ction – II			
Q.4	Solv a) b) c) d)	<b>ve any three.</b> Discuss PERT. Explain Model of List Steps for Re Explain the mana	Risk Framewo source Plannii agement proce	ork. ng. ess with its ne	ed.		12
Q.5	Solv a) b)	<b>/e any two.</b> Explain project e Explain risk ident identification.	valuation with tification? Whit	its significanc ch are two me	e. ethods used for ris	k	16

c) Draw an activity network using either activity on node or activity on arrow network convention for Project "Choosing & Purchasing a Laptop".

SLR-FM-687

Seat No.

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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 indicates 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
  - Test automation helps to 1)
    - a) Reduce the cost of testing
    - c) Reduce time of testing
- b) Increase the cost of testing
- d) Increase time of testing
- 2) CBSE Approach is based on
  - a) Existence of reusable components
  - Existence of new components b)
  - Nonexistence of components c)
  - d) None of above
- 3) Software Specification is process of \_
  - Understanding & defining service required a)
  - Identifying the constraints on system b)
  - Both a & b C)
  - Identifying document d)
- 4) Scheduling can best be defined as the process used to determine \_\_\_\_\_. a) overall project duration

d)

- project cost estimating b) sub-contractor's responsibilities
- c) the project management plan
- 5) Risk is
  - a) Event which may arrive in future
  - b) Negative effect causing events
  - c) Problems arriving in project
  - d) All are correct
- The basic resource of the organization is 6)
  - Money b) Machines a)
  - Manpower d) All of them c)
- 7) Framework of risk contains the categories as
  - Task Actors a) b) Structure and technology All d) C)
- 8) Cascade Arrangement is Present in
  - **Evolutionary Development** b) Incremental Delivery a)
  - c) Waterfall Model
- d) None

Set

Max. Marks: 70

Marks: 14

Q

SLR-FM-687 Set Q

- 9) Functional Requirements considers \_\_\_\_
  - a) Output
  - c) Security
- 10) System testing involves \_\_\_\_\_.
  - a) Integration testing
  - c) Interface testing
- 11) Behavioral Model is called as \_\_\_\_\_
  - a) Object Model b) Dataflow model
  - c) Context Model d) V Model
- 12) RUP having four phases in a sequence as \_\_\_\_\_.
  - a) Inception- Collaboration-Transition Revision.
  - b) Inception- Elaboration -Construction-Transition.
  - c) Elaboration-Inception-Construction-Transition.
  - d) Transition-Inception- Elaboration -Construction
- 13) Dataflow Model & state machine model are types of \_
  - b) Behavioral Model

Input

Input & output

Release testing

Both a and b

b)

d)

b)

d)

- d) All
- 14) Partition testing is part of \_\_\_\_\_.

Context Model

a)

C)

a) Release testing

Data Model

c) System testing

- b) Component testing
- d) Performance testing

No.					Sei	Q
;	T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM					
Day 8 Time	& Da : 02::	te: Wednesday, 1´ 30 PM To 05:30 P	I-12-2019 M		Max. Marks	s: 56
Instr	Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.					
			Sectio	n – I		
Q.2	Sol <sup>*</sup> a) b) c) d) e)	ve any three. Explain Software Explain Test Aut Explain in detail Compare: V Moo List & Explain ch	E Life Cycle concep omation. System Testing. lel with Prototyping ar. of Software Pro	t. Model. cess.		12
Q.3	Sol <sup>*</sup> a) b) c) d)	ve any two. Write note on RU List types of non- requirement. List System Mod Compare Functio	JP with Diagram & -functional requirer els & explain any c onal Requirement v	Phases. nent. Explain general stru one of them. vith Nonfunctional Requir	ucture of rement.	16
			Section	- 11		
Q.4	Sol <sup>a</sup> ) b) c) d)	<b>ve any three.</b> Discuss PERT. Explain Model of List Steps for Re Explain the mana	Risk Framework. source Planning. agement process w	vith its need.		12
Q.5	Sol <sup>ı</sup> a) b)	<b>ve any two.</b> Explain project e Explain risk iden identification.	valuation with its si tification? Which ar	gnificance. e two methods used for i	risk	16

c)

## **SLR-FM-687**

Seat

- Draw an activity network using either activity on node or activity on arrow network convention for Project "Choosing & Purchasing a Laptop".



Set

Max. Marks: 70

Marks: 14

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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 indicates full marks.

#### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

a)

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

- RUP having four phases in a sequence as \_\_\_\_\_ 1)
  - a) Inception- Collaboration-Transition Revision.
  - b) Inception- Elaboration -Construction-Transition.
  - Elaboration-Inception-Construction-Transition. C)
  - d) Transition-Inception- Elaboration -Construction
- 2) Dataflow Model & state machine model are types of
  - Context Model b)
  - Data Model c)
- 3) Partition testing is part of \_\_\_\_\_.
  - a) Release testing
  - c) System testing
- 4) Test automation helps to \_\_\_\_\_
  - a) Reduce the cost of testing
  - c) Reduce time of testing
- 5) CBSE Approach is based on \_\_\_\_
  - a) Existence of reusable components
  - Existence of new components b)
  - c) Nonexistence of components
  - d) None of above
- Software Specification is process of 6)
  - a) Understanding & defining service required
  - b) Identifying the constraints on system
  - Both a & b C)

Risk is .

d) All are correct

8)

- d) Identifying document
- 7) Scheduling can best be defined as the process used to determine \_\_\_\_\_.
  - a) overall project duration
  - c) the project management plan d)

a) Event which may arrive in future b) Negative effect causing events c) Problems arriving in project

- b) project cost estimating
  - sub-contractor's responsibilities

- b) Component testing
- Performance testing d)
- Increase the cost of testing
- Increase time of testing d)

b)

d) All

No.

Seat

R

- **Behavioral Model**



9) The basic resource of the organization is \_\_\_\_\_. a) Money b) Machines c) Manpower d) All of them Framework of risk contains the categories as \_\_\_\_\_ 10) a) Actors b) Task c) Structure and technology d) All Cascade Arrangement is Present in 11) a) Evolutionary Development b) **Incremental Delivery** c) Waterfall Model d) None 12) Functional Requirements considers \_ a) Output b) Input c) Security d) Input & output 13) System testing involves \_\_\_\_\_. a) Integration testing b) Release testing Both a and b c) Interface testing d) Behavioral Model is called as \_\_\_\_ 14) a) Object Model b) Dataflow model c) Context Model d) V Model

**SLR-FM-687** 

Set R

Seat No.	t	Set	R			
	T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM					
Day & Time	Day & Date: Wednesday, 11-12-2019         Max. Marks: 56           Time: 02:30 PM To 05:30 PM         Max. Marks: 56					
Instr	<b>ructions:</b> 1) All questions are compulsory. 2) Figures to the right indicate full marks.					
	Section – I					
Q.2	<ul> <li>Solve any three.</li> <li>a) Explain Software Life Cycle concept.</li> <li>b) Explain Test Automation.</li> <li>c) Explain in detail System Testing.</li> <li>d) Compare V Model with Protecturing Model</li> </ul>		12			
	<ul> <li>e) List &amp; Explain char. of Software Process.</li> </ul>					
Q.3	<ul> <li>Solve any two.</li> <li>a) Write note on RUP with Diagram &amp; Phases.</li> <li>b) List types of non-functional requirement. Explain general structurequirement.</li> <li>c) List System Models &amp; explain any one of them.</li> <li>d) Compare Functional Requirement with Nonfunctional Requirement</li> </ul>	ire of ent.	16			
	Section – II					
Q.4	<ul> <li>Solve any three.</li> <li>a) Discuss PERT.</li> <li>b) Explain Model of Risk Framework.</li> <li>c) List Steps for Resource Planning.</li> <li>d) Explain the management process with its need.</li> </ul>		12			
Q.5	<ul> <li>Solve any two.</li> <li>a) Explain project evaluation with its significance.</li> <li>b) Explain risk identification? Which are two methods used for risk identification.</li> </ul>		16			

Draw an activity network using either activity on node or activity on arrow network convention for Project "Choosing & Purchasing a Laptop". c)

**SLR-FM-687** 

# Seat

### Seat No.

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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 indicates full marks.

### MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
  - 1) Software Specification is process of \_
    - a) Understanding & defining service required
    - b) Identifying the constraints on system
    - c) Both a & b
    - d) Identifying document
  - Scheduling can best be defined as the process used to determine \_\_\_\_\_.
    - a) overall project durationc) the project management plan
- b) project cost estimating
   d) sub-contractor's responsibilities

- 3) Risk is \_\_\_\_
  - a) Event which may arrive in future
  - b) Negative effect causing events
  - c) Problems arriving in project
  - d) All are correct

#### 4) The basic resource of the organization is \_\_\_\_\_

- a) Money b) Machines
- c) Manpower d) All of them

5) Framework of risk contains the categories as \_\_\_\_\_

a) Actors b) Task c) Structure and technology d) All

6) Cascade Arrangement is Present in \_\_\_\_\_.

- a) Evolutionary Development b) Incremental Delivery
  - c) Waterfall Model d) None
- 7) Functional Requirements considers \_\_\_\_\_.
  - a) Output b) Input
  - c) Security d) Input & output

### 8) System testing involves \_\_\_\_\_.

- a) Integration testingb) Release testingc) Interface testingd) Both a and b
- 9) Behavioral Model is called as \_\_\_\_\_.
  - a) Object Model b) Dataflow model
  - c) Context Model d) V Model

Set S

Max. Marks: 70

Marks: 14

- 10) RUP having four phases in a sequence as .
  - a) Inception- Collaboration-Transition Revision.
  - b) Inception- Elaboration -Construction-Transition.
  - Elaboration-Inception-Construction-Transition. c)
  - d) Transition-Inception- Elaboration -Construction
- 11) Dataflow Model & state machine model are types of a) Context Model
  - Behavioral Model b)
  - c) Data Model
- d) All
- 12) Partition testing is part of \_\_\_\_\_.
  - a) Release testing
  - c) System testing
- b) Component testing
- Performance testing d)
- 13) Test automation helps to \_\_\_\_
  - a) Reduce the cost of testing
  - c) Reduce time of testing
- 14) CBSE Approach is based on \_\_\_\_
  - a) Existence of reusable components
  - b) Existence of new components
  - c) Nonexistence of components
  - d) None of above

- b) Increase the cost of testing
- Increase time of testing d)

**SLR-FM-687** Set S

No.					361	3
	T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM					
Day o Time	& Da : 02::	te: Wednesday, 1′ 30 PM To 05:30 P	I-12-2019 M		Max. Mark	s: 56
Instr	Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.					
			Section	-1		
Q.2	Sol <sup>*</sup> a) b) c) d) e)	ve any three. Explain Software Explain Test Aut Explain in detail Compare: V Moo List & Explain ch	e Life Cycle concept. omation. System Testing. lel with Prototyping N ar. of Software Proce	lodel. ess.		12
Q.3	Sol <sup>*</sup> a) b) c) d)	ve any two. Write note on RL List types of non requirement. List System Mod Compare Functio	JP with Diagram & Ph -functional requireme els & explain any one onal Requirement wit	nases. nt. Explain general structur e of them. h Nonfunctional Requireme	re of ent.	16
			Section -	II		
Q.4	Sol <sup>*</sup> a) b) c) d)	<b>ve any three.</b> Discuss PERT. Explain Model of List Steps for Re Explain the mana	Risk Framework. source Planning. agement process with	n its need.		12
Q.5	Sol <sup>ı</sup> a) b)	<b>ve any two.</b> Explain project e Explain risk iden identification.	valuation with its sigr tification? Which are	nificance. two methods used for risk		16

c)

### **SLR-FM-687**

Seat

- Draw an activity network using either activity on node or activity on arrow network convention for Project "Choosing & Purchasing a Laptop".

Set S

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING

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 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
  - A Discrete Time signal has \_\_\_\_\_. 1)
    - Continuous time continuous amplitude a)
    - Continuous time discrete amplitude b)
    - Discrete time continuous amplitude c)
    - Discrete time discrete amplitude d)
  - 2) Circular convolution of the sequences  $x(n) = \{1, 2, 1\}$  and  $h(n) = \{1, -2, 2\}$  is \_\_\_\_\_.
    - a) {1,2,1} b) {3,2,1}
    - c) {3,2,-1} d) {3.2.2}

3) Multiplication are required to compute N point DFT \_\_\_\_

- a) Ν b) N(N-1)  $N^2$  $N^3$ c) d)
- 4) The magnitude response for DFT exhibits complex conjugate property if time sequence is .
  - a real sequence b) a complex sequence a)
  - an imaginary sequence d) not a real sequence C)

d)

Input sequence

None

- Decimation in time FFT decimates \_ 5) b)
  - DFT coefficients a)
  - Both sequence and DFT c)
- Circular convolution can be performed using the methods 6) Matrix Multiplication
  - **Concentric Circle** a) b)
  - Both a & b d) None of above c)
- In DIT, the data x(n) is stored in \_\_\_\_ order. 7)
  - a) Reversed order b) Bit reversal
  - Non-shuffled d) None C)
- Convolution of Ideal filter response and sync function results in. 8)
  - Side Lobe oscillations a)
  - Main Lobe oscillations b)
  - Sharpening of a transition width c)
  - Decrease in main lobe d)

Max. Marks: 70



**SLR-FM-688** 

Marks: 14

Set P

- 9) Unwrapped phase response of FIR filter in pass band is \_
  - a) Exponentially increasing
- b) Exponentially decreasing
- c) Non-linear d) linear
- 10) When analog butter worth filter is converted to DT filter using Impulse Invariance method, then \_\_\_\_\_.
  - a) Aliasing can be eliminated
  - b) Aliasing is always present
  - c) Aliasing can be reduced by reducing T
  - d) Aliasing cannot be reduced by reducing T
- 11) The binary signed number 0.11010111 when rounded to seven bits will result in number given by \_\_\_\_\_.
  - a) 0.1101011 b) 0.1101010
  - c) 0.1101100 d) 0.1101110
- 12) Properties of butter worth low pass filter is given by \_\_\_\_\_.
  - a) The poles of butter worth filter lies on a circle
  - b) The poles of butter worth filter lies outside the a circle
  - c) The poles of butter worth filter lies inside the a circle
  - d) Not a real sequence
- 13) The mapping for Impulse Invariance Method is \_\_\_\_\_.
  - a) many to many mapping
- b) many to one mapping
- c) one to one mapping
- d) none of above
- 14) Impulse invariant method will convert analog filter to DT filter that has \_\_\_\_\_.a) Same frequency response as that of analog filter and is stable
  - b) Different frequency response and is unstable
  - c) Same frequency response and is unstable
  - d) Different frequency response and is stable

#### Set T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING 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) Assume necessary data if necessary. Section – I Q.2 Attempt any three. Determine the cross correlation sequence of sequences. a) $X(n) = \{1, 2, 3, 4, 5\}, y(n) = \{5, 6, 7, 8, 9\}$

- **b)** Find the circular convolution of given data sequences.
- $X_1(n) = \{1, 1, -1, -1\}, x_2(n) = \{1, 0, -1, 0, -1\}$
- c) Explain the periodicity property of DFT.
- d) Derive the equation for Circular convolution.
- e) Explain Chirp 'Z' transform in short.

#### Q.3 Attempt any two.

- Determine the output of a linear FIR filter whose impulse response a)  $h(n) = \{1, 2, 3\}$  and the input signal  $x(n) = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  using overlap save method, verify by linear convolution.
- b) Determine the DFT of the given data sequence  $X(n) = \{-1, 2, -3, 4, 9, -20, 12, 6\}$ By Decimation in time FFT Algorithm.
- c) Given  $x(n)=2^n$  and N=8, find X(k) using DIF FFT algorithm.

#### Section – II

#### Q.4 Solve Any Three.

- a) Explain in detail Fourier Series Design Method.
- b) Realize the system with difference equation in Cascade Form.  $y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$
- Explain the finite word length effect in FIR Filter. c)
- d) What is warping effect? What is its effect on magnitude and phase response?
- e) Explain the application of DSP in Telecommunication.

#### Q.5 Solve any two.

Design a ideal high pass filter with a frequency response using hanning a) window.

$$Hd(e^{j\omega}) = 1 \quad \text{for} \frac{\pi}{4} \le |\omega| \le \pi$$
$$= 0 \quad \text{for} |\omega| \le \frac{\pi}{4}$$

Find the values of h(n) for N=11 and Find H (Z).

- **b)** Apply impulse invariant method and find H(z) for  $H(s) = \frac{s+a}{(s+a)^2+b^2}$
- c) A digital filter with a 3dB bandwidth of  $0.25\pi$  is to be designed from the analog filter whose system response is  $H(s) = \frac{\Omega_c}{s+\Omega_c}$  Use Bilinear transformation and obtain H(z).

Max. Marks: 56

12

16

12

16



Seat No.

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING

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 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

- Convolution of Ideal filter response and sync function results in. 1)
  - Side Lobe oscillations a)
  - b) Main Lobe oscillations
  - Sharpening of a transition width c)
  - Decrease in main lobe d)
- 2) Unwrapped phase response of FIR filter in pass band is b) Exponentially decreasing
  - Exponentially increasing a)
  - Non-linear C) d) linear
- 3) When analog butter worth filter is converted to DT filter using Impulse Invariance method, then \_
  - Aliasing can be eliminated a)
  - Aliasing is always present b)
  - Aliasing can be reduced by reducing T c)
  - Aliasing cannot be reduced by reducing T d)
- The binary signed number 0.11010111 when rounded to seven bits will 4) result in number given by \_\_\_\_\_.
  - 0.1101011 b) 0.1101010 a)
  - 0.1101100 d) 0.1101110 c)
- Properties of butter worth low pass filter is given by \_\_\_\_\_. 5)
  - The poles of butter worth filter lies on a circle a)
  - The poles of butter worth filter lies outside the a circle b)
  - The poles of butter worth filter lies inside the a circle c)
  - d) Not a real sequence
- 6) The mapping for Impulse Invariance Method is \_\_\_\_
  - b) many to one mapping many to many mapping a)
  - one to one mapping d) none of above c)
- Impulse invariant method will convert analog filter to DT filter that has 7)
  - Same frequency response as that of analog filter and is stable a)
  - Different frequency response and is unstable b)
  - Same frequency response and is unstable c)
  - Different frequency response and is stable d)

Max. Marks: 70



Marks: 14

Set Q

- 8) A Discrete Time signal has .
  - Continuous time continuous amplitude a)
  - Continuous time discrete amplitude b)
  - c) Discrete time continuous amplitude
  - d) Discrete time discrete amplitude

Circular convolution of the sequences  $x(n)=\{1,2,1\}$  and  $h(n)=\{1,-2,2\}$  is \_\_\_\_\_. 9)

- {1,2,1} b) {3,2,1} a) C)
  - d) {3,2,2} {3,2,-1}

Multiplication are required to compute N point DFT \_\_\_\_\_. 10)

- Ν a)  $N^2$ c)
- b) N(N-1)  $N^3$ d)
- 11) The magnitude response for DFT exhibits complex conjugate property if time sequence is \_\_\_\_\_.
  - a) a real sequence
- b) a complex sequence
- an imaginary sequence C)
- d) not a real sequence
- Decimation in time FFT decimates
- 12) DFT coefficients a)
  - C)
    - Both sequence and DFT
- b) Input sequence d) None
- 13) Circular convolution can be performed using the methods \_
  - Concentric Circle a)

Both a & b

c)

- b) Matrix Multiplication
- d) None of above
- In DIT, the data x(n) is stored in \_\_\_\_\_ order. 14)
  - Reversed order a) Non-shuffled C)
- b) Bit reversal
- d) None

#### Seat No. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING Day & Date: Friday, 13-12-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM **Instructions:** 1) All questions are compulsory. 2) Figure to the right indicates full marks. 3) Assume necessary data if necessary. Section – I Q.2 Attempt any three. 12 Determine the cross correlation sequence of sequences. a) $X(n) = \{1, 2, 3, 4, 5\}, y(n) = \{5, 6, 7, 8, 9\}$ **b)** Find the circular convolution of given data sequences. $X_1(n) = \{1, 1, -1, -1\}, x_2(n) = \{1, 0, -1, 0, -1\}$ c) Explain the periodicity property of DFT.

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- c) Given  $x(n)=2^n$  and N=8, find X(k) using DIF FFT algorithm.

#### Section – II

#### Q.4 Solve Any Three.

- a) Explain in detail Fourier Series Design Method.
- b) Realize the system with difference equation in Cascade Form.  $y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$
- Explain the finite word length effect in FIR Filter. c)
- d) What is warping effect? What is its effect on magnitude and phase response?
- Explain the application of DSP in Telecommunication. e)

#### Q.5 Solve any two.

Design a ideal high pass filter with a frequency response using hanning a) window.

$$Hd(e^{j\omega}) = 1 \quad \text{for} \frac{\pi}{4} \le |\omega| \le \pi$$
$$= 0 \quad \text{for} |\omega| \le \frac{\pi}{4}$$

Find the values of h(n) for N=11 and Find H (Z).

- **b)** Apply impulse invariant method and find H(z) for  $H(s) = \frac{s+a}{(s+a)^2+b^2}$
- c) A digital filter with a 3dB bandwidth of  $0.25\pi$  is to be designed from the analog filter whose system response is  $H(s) = \frac{\Omega_c}{s+\Omega_c}$  Use Bilinear transformation and obtain H(z).

**SLR-FM-688** 

Set

16

16

## T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

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 the right indicate full marks.

#### MCQ/Objective Type Questions

Duration: 30 Minutes

c)

c)

Seat No.

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

1) Decimation in time FFT decimates \_

Both sequence and DFT

a) DFT coefficients

Both a & b

- b) Input sequenced) None
- 2) Circular convolution can be performed using the methods
  - a) Concentric Circle
- b) Matrix Multiplicationd) None of above
- d) None of above
- 3) In DIT, the data x(n) is stored in \_\_\_\_\_ order.
  - a) Reversed order b) Bit reversal
    - c) Non-shuffled d) None
- 4) Convolution of Ideal filter response and sync function results in.
  - a) Side Lobe oscillations
  - b) Main Lobe oscillations
  - c) Sharpening of a transition width
  - d) Decrease in main lobe
- 5) Unwrapped phase response of FIR filter in pass band is \_\_\_\_\_
  - a) Exponentially increasing b) Exponentially decreasing
    - c) Non-linear d) linear
- 6) When analog butter worth filter is converted to DT filter using Impulse Invariance method, then \_\_\_\_\_.
  - a) Aliasing can be eliminated
  - b) Aliasing is always present
  - c) Aliasing can be reduced by reducing T
  - d) Aliasing cannot be reduced by reducing T
- 7) The binary signed number 0.11010111 when rounded to seven bits will result in number given by \_\_\_\_\_.
  - a) 0.1101011 b) 0.1101010
  - c) 0.1101100 d) 0.1101110
- 8) Properties of butter worth low pass filter is given by \_\_\_\_\_.
  - a) The poles of butter worth filter lies on a circle
  - b) The poles of butter worth filter lies outside the a circle
  - c) The poles of butter worth filter lies inside the a circle
  - d) Not a real sequence

Max. Marks: 70

Marks: 14

- Set R
- 9) The mapping for Impulse Invariance Method is \_\_\_\_\_.
  - a) many to many mapping
- b) many to one mappingd) none of above
- c) one to one mapping
- d) none of above
- 10) Impulse invariant method will convert analog filter to DT filter that has \_\_\_\_\_.
  - a) Same frequency response as that of analog filter and is stable
  - b) Different frequency response and is unstable
  - c) Same frequency response and is unstable
  - d) Different frequency response and is stable
- 11) A Discrete Time signal has \_\_\_\_\_
  - a) Continuous time continuous amplitude
  - b) Continuous time discrete amplitude
  - c) Discrete time continuous amplitude
  - d) Discrete time discrete amplitude
- 12) Circular convolution of the sequences  $x(n) = \{1, 2, 1\}$  and  $h(n) = \{1, -2, 2\}$  is \_\_\_\_\_.
  - a) {1,2,1} b) {3,2,1}
  - c) {3,2,-1} d) {3,2,2}

13) Multiplication are required to compute N point DFT \_\_\_\_\_.

- b) N(N-1)
- c)  $N^2$  d)  $N^3$
- 14) The magnitude response for DFT exhibits complex conjugate property if time sequence is \_\_\_\_\_.
  - a) a real sequence

a)

Ν

- c) an imaginary sequence
- b) a complex sequence
- d) not a real sequence

#### No. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING Day & Date: Friday, 13-12-2019 Max. Marks: 56 Time: 02:30 PM To 05:30 PM **Instructions:** 1) All questions are compulsory. 2) Figure to the right indicates full marks. 3) Assume necessary data if necessary. Section – I Q.2 Attempt any three. 12 Determine the cross correlation sequence of sequences. a) $X(n) = \{1, 2, 3, 4, 5\}, y(n) = \{5, 6, 7, 8, 9\}$ **b)** Find the circular convolution of given data sequences. $X_1(n) = \{1, 1, -1, -1\}, x_2(n) = \{1, 0, -1, 0, -1\}$ c) Explain the periodicity property of DFT. d) Derive the equation for Circular convolution. e) Explain Chirp 'Z' transform in short. Q.3 Attempt any two. 16 Determine the output of a linear FIR filter whose impulse response a) $h(n) = \{1, 2, 3\}$ and the input signal $x(n) = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ using overlap save method, verify by linear convolution. b) Determine the DFT of the given data sequence $X(n) = \{-1, 2, -3, 4, 9, -20, 12, 6\}$ By Decimation in time FFT Algorithm. c) Given $x(n)=2^n$ and N=8, find X(k) using DIF FFT algorithm. Section – II Q.4 Solve Any Three. 12 a) Explain in detail Fourier Series Design Method. b) Realize the system with difference equation in Cascade Form.

- $y(n) = \frac{3}{4}y(n-1) \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$
- Explain the finite word length effect in FIR Filter. c)
- d) What is warping effect? What is its effect on magnitude and phase response?
- e) Explain the application of DSP in Telecommunication.

#### Q.5 Solve any two.

Design a ideal high pass filter with a frequency response using hanning a) window.

$$Hd(e^{j\omega}) = 1 \quad \text{for} \frac{\pi}{4} \le |\omega| \le \pi$$
$$= 0 \quad \text{for} |\omega| \le \frac{\pi}{4}$$

Find the values of h(n) for N=11 and Find H (Z).

- **b)** Apply impulse invariant method and find H(z) for  $H(s) = \frac{s+a}{(s+a)^2+b^2}$
- c) A digital filter with a 3dB bandwidth of  $0.25\pi$  is to be designed from the analog filter whose system response is  $H(s) = \frac{\Omega_c}{s+\Omega_c}$  Use Bilinear transformation and obtain H(z).

# Seat

**SLR-FM-688** 

Set

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering DIGITAL SIGNAL PROCESSING

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 the right indicate full marks.

#### 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

- 1) When analog butter worth filter is converted to DT filter using Impulse Invariance method, then \_\_\_\_\_.
  - a) Aliasing can be eliminated
  - b) Aliasing is always present
  - c) Aliasing can be reduced by reducing T
  - d) Aliasing cannot be reduced by reducing T
- 2) The binary signed number 0.11010111 when rounded to seven bits will result in number given by \_\_\_\_\_.
  - a) 0.1101011 b) 0.1101010
  - c) 0.1101100 d) 0.1101110
- 3) Properties of butter worth low pass filter is given by \_\_\_\_\_.
  - a) The poles of butter worth filter lies on a circle
  - b) The poles of butter worth filter lies outside the a circle
  - c) The poles of butter worth filter lies inside the a circle
  - d) Not a real sequence

4) The mapping for Impulse Invariance Method is \_\_\_\_\_

- a) many to many mapping b) many to one mapping
- c) one to one mapping d) none of above
- 5) Impulse invariant method will convert analog filter to DT filter that has \_\_\_\_\_.
  - a) Same frequency response as that of analog filter and is stable
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  - c) Same frequency response and is unstable
  - d) Different frequency response and is stable
- 6) A Discrete Time signal has \_\_\_\_\_
  - a) Continuous time continuous amplitude
  - b) Continuous time discrete amplitude
  - c) Discrete time continuous amplitude
  - d) Discrete time discrete amplitude
- 7) Circular convolution of the sequences  $x(n)=\{1,2,1\}$  and  $h(n)=\{1,-2,2\}$  is \_\_\_\_\_.
  - a) {1,2,1} b) {3,2,1}
  - c) {3,2,-1} d) {3,2,2}



Max. Marks: 70

- Set S
- 8) Multiplication are required to compute N point DFT

b) N(N-1)

 $N^3$ 

d)

- a) N  $N^2$
- C) The magnitude response for DFT exhibits complex conjugate property if
  - time sequence is \_\_\_\_\_. a) a real sequence

9)

- an imaginary sequence c)
- b) a complex sequence
- d) not a real sequence
- Decimation in time FFT decimates \_ 10)
  - a) DFT coefficients b) Input sequence
  - Both sequence and DFT c) d) None
- 11) Circular convolution can be performed using the methods \_\_\_\_
  - a) Concentric Circle b) Matrix Multiplication
  - c) Both a & b d) None of above
- 12) In DIT, the data x(n) is stored in \_\_\_\_\_ order.
  - a) Reversed order b) Bit reversal
  - c) Non-shuffled d) None
- Convolution of Ideal filter response and sync function results in. 13) Side Lobe oscillations a)
  - Main Lobe oscillations b)
  - Sharpening of a transition width c)
  - Decrease in main lobe d)
- 14) Unwrapped phase response of FIR filter in pass band is
  - Exponentially increasing a)
  - Non-linear c)

- b) Exponentially decreasing
- d) linear

## No. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

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) Assume necessary data if necessary.

#### Section – I

**Electronics & Telecommunication Engineering** DIGITAL SIGNAL PROCESSING

#### Q.2 Attempt any three.

- Determine the cross correlation sequence of sequences. a)  $X(n) = \{1, 2, 3, 4, 5\}, y(n) = \{5, 6, 7, 8, 9\}$
- **b)** Find the circular convolution of given data sequences.  $X_1(n) = \{1, 1, -1, -1\}, x_2(n) = \{1, 0, -1, 0, -1\}$
- c) Explain the periodicity property of DFT.
- d) Derive the equation for Circular convolution.
- e) Explain Chirp 'Z' transform in short.

#### Q.3 Attempt any two.

- Determine the output of a linear FIR filter whose impulse response a)  $h(n) = \{1, 2, 3\}$  and the input signal  $x(n) = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  using overlap save method, verify by linear convolution.
- b) Determine the DFT of the given data sequence  $X(n) = \{-1, 2, -3, 4, 9, -20, 12, 6\}$ By Decimation in time FFT Algorithm.
- c) Given  $x(n)=2^n$  and N=8, find X(k) using DIF FFT algorithm.

#### Section – II

#### Q.4 Solve Any Three.

- a) Explain in detail Fourier Series Design Method.
- b) Realize the system with difference equation in Cascade Form.  $y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$
- Explain the finite word length effect in FIR Filter. c)
- d) What is warping effect? What is its effect on magnitude and phase response?
- e) Explain the application of DSP in Telecommunication.

#### Q.5 Solve any two.

a) Design a ideal high pass filter with a frequency response using hanning window.

$$Hd(e^{j\omega}) = 1 \quad \text{for} \frac{\pi}{4} \le |\omega| \le \pi$$
$$= 0 \quad \text{for} |\omega| \le \frac{\pi}{4}$$

Find the values of h(n) for N=11 and Find H (Z).

- **b)** Apply impulse invariant method and find H(z) for  $H(s) = \frac{s+a}{(s+a)^2+b^2}$
- c) A digital filter with a 3dB bandwidth of  $0.25\pi$  is to be designed from the analog filter whose system response is  $H(s) = \frac{\Omega_c}{s+\Omega_c}$  Use Bilinear transformation and obtain H(z).

Set

Max. Marks: 56

12

16

16



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		0	book.		
		3	) Figures to the right indicates full ) Assume suitable data if necessa	mark ary.	ίS.
			MCQ/Objective Ty	vpe C	Questions
Dura	tion: 3	0 Mi	nutes	-	
Q.1	<b>Choo</b> 1)	<b>se f</b> The con a) c)	the correct alternatives from the contents of accumulator before itents after instruction execution is A5H AAH	e opt CMA s b) d)	ions. instruction are A5 H. Its  5AH 55H
	2)	The be, MV OR RAI a) c)	e contents of accumulator after ex I A, B7 H A A L 4FH 5FH	b) d)	on of following Instruction 5EH EFH
	3)	The a) c)	e width of address bus and data b 16,8 8,8	ous of b) d)	8085 are respectively 8,16 16,16
	4)	In r mei a) c)	esponse to RST 7.5 interrupt, the mory location 0000H 0034H	exec b) d)	cution of control transfers t 002CH 003CH
	5)	The a) c)	e status of S0 and S1 pins for me 0,0 1,0	mory b) d)	write is 0,1 1,1
	6)	lf th PU a) c)	ne contents of SP are 1000H, the SH B instruction are 0FFFH, 0FFEH 1000 H, 0FFF H	conte b) d)	ent of B and C registers af 0FFE H, 0FFF 1000 H, 1001H

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering MICROPROCESSORS** 

Day & Date: Monday, 16-12-2019 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

#### C

- s will
- to
- fter
- In an 8085 based system, the maximum number of input output devices 7) can be connected using I/0 mapped I/O method is \_\_\_\_\_.
  - a) 64 b) 512
  - 256 d) 65536 C)

**SLR-FM-689** 



Max. Marks: 70

Marks: 14

			SLR-FM-689
			Set P
8)	<ul><li>8255 is interfaced with 8085 in mem</li><li>the data and store to I/O, respective</li><li>a) IN add , OUT add</li><li>c) LDA add, LDA add</li></ul>	nory n ly, us b) d)	happed I/O mode, then to read es the instructions STA, add , LDA add LDA add, STA add
9)	Control word format for mode 0 of 8 data byte only and BCD counter is _ a) 10 H c) 11 H	253 fo b) d)	or counter 0, Read/Load LSB  12 H None of the above
10)	How many flags are there in 8086? a) 9 c) 10	b) d)	8 7
11)	Direction of Gate signal for 8253 IC a) Input c) Bidirectional	is b) d)	 Output None
12)	Key debouncing can be obtained the a) Only software c) Both hardware & software	ro b) d)	 Only hardware None
13)	In control word format, if RL=1 and I is a) read /Load Least significant byte b) read /Load most significant byte c) read /Load LSB First and then M d) read /Load MSB First and then	RL0≕ e only e only ∕ISB LSB	0 then the operation performed

14)8251 supports the baud rate for asynchronous communication is \_\_\_\_\_.a)DC to 19.2 K bandb)DC to 64 K band

- c) DC to 128 K band
- d) Any baud rate

Max. Marks: 56

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROPROCESSORS

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 indicates full marks.
  - 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Solve any four.

Seat

No.

- a) Write an ALP for addition of two 16 bit BCD numbers.
- **b**) Compare memory mapped I/O and I/O mapped I/O in detail.
- c) Describe the features of 8085.
- d) Explain in detail addressing modes of 8085.
- e) Write an ALP to generate delay of 100 ms using crystal frequency of 3 MHz.

#### Q.3 Solve any two.

- a) Explain the following instructions in detail.
  - 1) PUSH B
  - 2) DAD D
  - 3) INX H
  - 4) CMP B
- **b)** Interface 6K x 8 EPROM memory using 2k x 8 memory chip. Give addressing range of each chip.
- c) Draw and Explain hardware Interrupt structure of 8085.

#### Section – II

#### Q.4 Solve any three.

- a) Explain mode 0 and mode 1 of 8255 PPI.
- b) Draw flag register of 8086 microprocessor. List the features of Pentium processor.
- c) Interface 8085 with 8255 using Memory mapped I/O technique.
- d) Draw and explain block diagram of 8251.

#### Q.5 Solve any two.

- a) Explain IC 8253 by considering the following parameters.
  - 1) Feature.
  - 2) Internal Block Diagram.
  - 3) Control word format.
- **b)** Interface ADC (8 bit, 8 channel) with 8085. Explain the interfacing circuit. Write ALP to read analog input and store the digital value at some memory location. Assume I/O mapped I/O technique.
- c) Interface stepper motor with 8085 microprocessor. Write an ALP to rotate stepper motor for only 180 degree angle rotation in clockwise direction then stop.

Assume step angle=7.5 degree/step.



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#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** MICROPROCESSORS 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 indicates 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.

- 8255 is interfaced with 8085 in memory mapped I/O mode, then to read 1) the data and store to I/O, respectively, uses the instructions STA, add , LDA add
  - a) IN add , OUT add b)
  - c) LDA add, LDA add d) LDA add, STA add
- 2) Control word format for mode 0 of 8253 for counter 0, Read/Load LSB data byte only and BCD counter is \_ 12 H
  - 10 H b) a)
  - c) 11 H d) None of the above
- 3) How many flags are there in 8086?
  - a) 9 b) 8 7 c) 10 d)
- 4) Direction of Gate signal for 8253 IC is
  - a) Input Output b)
  - c) Bidirectional d) None
- 5) Key debouncing can be obtained thro
  - a) Only software b) Only hardware Both hardware & software None C) d)
- 6) In control word format, if RL=1 and RL0=0 then the operation performed is
  - read /Load Least significant byte only a)
  - b) read /Load most significant byte only
  - read /Load LSB First and then MSB c)
  - d) read /Load MSB First and then LSB

#### 7) 8251 supports the baud rate for asynchronous communication is \_\_\_\_\_.

- DC to 19.2 K band DC to 64 K band b) a)
- DC to 128 K band c) d) Any baud rate
- 8) The contents of accumulator before CMA instruction are A5 H. Its contents after instruction execution is
  - a) A5H b) 5AH c) AAH d) 55H

## **SLR-FM-689**

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Max. Marks: 70

Marks: 14

				Set	Q
9)	The contents of accumulator after ex be, MVI A, B7 H ORA A RAL a) 4FH	(ecutions)	on of following Instructions	will	
	c) 5FH	d)	EFH		
10)	The width of address bus and data b a) 16,8 c) 8,8	ous of b) d)	8085 are respectively 8,16 16,16	·	
11)	In response to RST 7.5 interrupt, the memory location a) 0000H c) 0034H	exec b) d)	eution of control transfers to 002CH 003CH	)	
12)	The status of S0 and S1 pins for me a) 0,0 c) 1,0	mory b) d)	write is 0,1 1,1		
13)	If the contents of SP are 1000H, the PUSH B instruction are a) 0FFFH, 0FFEH c) 1000 H, 0FFF H	conte b) d)	ent of B and C registers afte 0FFE H, 0FFF 1000 H, 1001H	er	
14)	In an 8085 based system, the maxim	num n	umber of input output device	ces	

can be connected using I/0 mapped I/O method is \_\_\_\_\_.

- a) 64 b)
- 512 c) 256 d) 65536

**SLR-FM-689** 

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### **SLR-FM-689**

### Seat No.

#### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROPROCESSORS

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 indicates full marks.
  - 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Solve any four.

- a) Write an ALP for addition of two 16 bit BCD numbers.
- **b**) Compare memory mapped I/O and I/O mapped I/O in detail.
- c) Describe the features of 8085.
- d) Explain in detail addressing modes of 8085.
- e) Write an ALP to generate delay of 100 ms using crystal frequency of 3 MHz.

#### Q.3 Solve any two.

- a) Explain the following instructions in detail.
  - 1) PUSH B
  - 2) DAD D
  - 3) INX H
  - 4) CMP B
- **b)** Interface 6K x 8 EPROM memory using 2k x 8 memory chip. Give addressing range of each chip.
- c) Draw and Explain hardware Interrupt structure of 8085.

#### Section – II

#### Q.4 Solve any three.

- a) Explain mode 0 and mode 1 of 8255 PPI.
- b) Draw flag register of 8086 microprocessor. List the features of Pentium processor.
- c) Interface 8085 with 8255 using Memory mapped I/O technique.
- d) Draw and explain block diagram of 8251.

#### Q.5 Solve any two.

- a) Explain IC 8253 by considering the following parameters.
  - 1) Feature.
  - 2) Internal Block Diagram.
  - 3) Control word format.
- **b)** Interface ADC (8 bit, 8 channel) with 8085. Explain the interfacing circuit. Write ALP to read analog input and store the digital value at some memory location. Assume I/O mapped I/O technique.
- c) Interface stepper motor with 8085 microprocessor. Write an ALP to rotate stepper motor for only 180 degree angle rotation in clockwise direction then stop.

Assume step angle=7.5 degree/step.



Set

Max. Marks: 56

### Seat No. T.E. (Part – I) (Old) (CGPA) Exami

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROPROCESSORS

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 indicates full marks.
- 3) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** 

6)

### Q.1 Choose the correct alternatives from the options.

- 1) The status of S0 and S1 pins for memory write is \_\_\_\_\_.
  - a) 0,0 b) 0,1
- c) 1,0
  d) 1,1
  2) If the contents of SP are 1000H, the content of B and C registers after
  - PUSH B instruction are \_\_\_\_\_.
    - a) 0FFFH, 0FFEH b) 0FFE H, 0FFF
    - c) 1000 H, 0FFF H d) 1000 H, 1001H
- In an 8085 based system, the maximum number of input output devices can be connected using I/0 mapped I/O method is \_\_\_\_\_.
  - a) 64 b) 512
  - c) 256 d) 65536
- 4) 8255 is interfaced with 8085 in memory mapped I/O mode, then to read the data and store to I/O, respectively, uses the instructions \_\_\_\_\_.
  - a) IN add , OUT add c) LDA add, LDA add
- b) STA, add , LDA addd) LDA add, STA add
- 5) Control word format for mode 0 of 8253 for counter 0, Read/Load LSB data byte only and BCD counter is \_\_\_\_\_.
   a) 10 H
   b) 12 H
  - a) 10 H b)
  - c) 11 H d) None of the above How many flags are there in 8086?
  - a) 9 b) 8 c) 10 d) 7
- 7) Direction of Gate signal for 8253 IC is \_\_\_\_\_
  - a) Input b) Output c) Bidirectional d) None
- 8) Key debouncing can be obtained thro \_\_\_\_\_\_
   a) Only software b)
  - b) Only hardware
  - c) Both hardware & software d) None

SLR-FM-689



Max. Marks: 70

Marks: 14

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9)	In control word format, if RL=1 and F is a) read /Load Least significant byte b) read /Load most significant byte c) read /Load LSB First and then M d) read /Load MSB First and then L	RL0=( e only only ISB _SB	) then the operation performed
10)	<ul><li>8251 supports the baud rate for asyr</li><li>a) DC to 19.2 K band</li><li>c) DC to 128 K band</li></ul>	nchro b) d)	nous communication is DC to 64 K band Any baud rate
11)	The contents of accumulator before contents after instruction execution is a) A5H c) AAH	CMA s b) d)	instruction are A5 H. Its  5AH 55H
12)	The contents of accumulator after ex be, MVI A, B7 H ORA A RAL a) 4FH c) 5FH	b) d)	on of following Instructions will 5EH EFH
13)	The width of address bus and data b a) 16,8 c) 8,8	bus of b) d)	8085 are respectively 8,16 16,16
14)	In response to RST 7.5 interrupt, the memory location	exe	cution of control transfers to

- memory location \_\_\_\_ a) 0000H c) 0034H \_. b) 002CH
  - 003CH d)
R

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Max. Marks: 56

Seat	
No.	

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROPROCESSORS

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 indicates full marks.
  - 3) Assume suitable data if necessary.

#### Section – I

#### Q.2 Solve any four.

- a) Write an ALP for addition of two 16 bit BCD numbers.
- **b)** Compare memory mapped I/O and I/O mapped I/O in detail.
- c) Describe the features of 8085.
- d) Explain in detail addressing modes of 8085.
- e) Write an ALP to generate delay of 100 ms using crystal frequency of 3 MHz.

#### Q.3 Solve any two.

- a) Explain the following instructions in detail.
  - 1) PUSH B
  - 2) DAD D
  - 3) INX H
  - 4) CMP B
- **b)** Interface 6K x 8 EPROM memory using 2k x 8 memory chip. Give addressing range of each chip.
- c) Draw and Explain hardware Interrupt structure of 8085.

#### Section – II

#### Q.4 Solve any three.

- a) Explain mode 0 and mode 1 of 8255 PPI.
- b) Draw flag register of 8086 microprocessor. List the features of Pentium processor.
- c) Interface 8085 with 8255 using Memory mapped I/O technique.
- d) Draw and explain block diagram of 8251.

#### Q.5 Solve any two.

- a) Explain IC 8253 by considering the following parameters.
  - 1) Feature.
  - 2) Internal Block Diagram.
  - 3) Control word format.
- **b)** Interface ADC (8 bit, 8 channel) with 8085. Explain the interfacing circuit. Write ALP to read analog input and store the digital value at some memory location. Assume I/O mapped I/O technique.
- c) Interface stepper motor with 8085 microprocessor. Write an ALP to rotate stepper motor for only 180 degree angle rotation in clockwise direction then stop.

Assume step angle=7.5 degree/step.

Page **9** of **12** 

		T.E. (Part – I) (Old) (CGPA) Electronics & Telecomr MICROPRO	Exami nunica DCESS	ination Nov/Dec-2019 ation Engineering GORS	
Day Time	& Date : 02:3	e: Monday, 16-12-2019 0 PM To 05:30 PM		Max. M	arks: 70
Instr	uctio	ns: 1) Q. No. 1 is compulsory and s book. 2) Figures to the right indicates f 3) Assume suitable data if neces	hould b full mari ssary.	e solved in first 30 minutes in <s.< th=""><th>answer</th></s.<>	answer
_		MCQ/Objective	Туре 🤇	Questions	
Dura	tion: 3	30 Minutes		. M	arks: 14
Q.1	<b>Cho</b> 1)	Dise the correct alternatives from How many flags are there in 8086 a) 9 c) 10	the op ? b) d)	8 7	14
	2)	Direction of Gate signal for 8253 l a) Input c) Bidirectional	C is b) d)	Output None	
	3)	Key debouncing can be obtained t a) Only software c) Both hardware & software	thro b) d)	 Only hardware None	
	4)	In control word format, if RL=1 and is a) read /Load Least significant b b) read /Load most significant by c) read /Load LSB First and ther d) read /Load MSB First and the	d RL0=( yte only rte only n MSB n LSB	) then the operation performed	t
	5)	<ul><li>8251 supports the baud rate for as</li><li>a) DC to 19.2 K band</li><li>c) DC to 128 K band</li></ul>	synchro b) d)	nous communication is DC to 64 K band Any baud rate	·
	6)	The contents of accumulator before contents after instruction execution a) A5H c) AAH	re CMA n is b) d)	instruction are A5 H. Its  5AH 55H	
	7)	The contents of accumulator after be, MVI A, B7 H ORA A RAL a) 4FH c) 5FH	executi b) d)	on of following Instructions wil 5EH EFH	I
	8)	The width of address bus and data a) 16,8	a bus of b)	8085 are respectively 8,16	

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No.

- 16,16 c) 8,8
  - d)

Set S

**SLR-FM-689** Set S

- 9) In response to RST 7.5 interrupt, the execution of control transfers to memory location \_\_\_\_\_.
  - a) 0000H b) 002CH
  - c) 0034H 003CH d)
- 10) The status of S0 and S1 pins for memory write is \_\_\_\_\_.
  - a) 0.0 b) 0.1 d) 1,1
  - c) 1,0 If the contents of SP are 1000H, the content of B and C registers after
- 11) PUSH B instruction are \_\_\_\_\_.
  - a) 0FFFH, 0FFEH b) OFFE H, OFFF
  - c) 1000 H, 0FFF H d) 1000 H, 1001H
- 12) In an 8085 based system, the maximum number of input output devices can be connected using I/0 mapped I/O method is .
  - a) 64 512 b) c) 256
    - d) 65536
- 8255 is interfaced with 8085 in memory mapped I/O mode, then to read 13) the data and store to I/O, respectively, uses the instructions \_
  - a) IN add , OUT add
  - c) LDA add, LDA add
- b) STA, add , LDA add
- LDA add, STA add d)
- 14) Control word format for mode 0 of 8253 for counter 0, Read/Load LSB data byte only and BCD counter is \_ a) 10 H
- b) 12 H d) None of the above

c) 11 H

Page **11** of **12** 

Set

### Seat No.

### T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering MICROPROCESSORS

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 indicates full marks.
  - 3) Assume suitable data if necessary.

### Section – I

### Q.2 Solve any four.

- a) Write an ALP for addition of two 16 bit BCD numbers.
- **b)** Compare memory mapped I/O and I/O mapped I/O in detail.
- c) Describe the features of 8085.
- d) Explain in detail addressing modes of 8085.
- e) Write an ALP to generate delay of 100 ms using crystal frequency of 3 MHz.

### Q.3 Solve any two.

- a) Explain the following instructions in detail.
  - 1) PUSH B
  - 2) DAD D
  - 3) INX H
  - 4) CMP B
- **b)** Interface 6K x 8 EPROM memory using 2k x 8 memory chip. Give addressing range of each chip.
- c) Draw and Explain hardware Interrupt structure of 8085.

### Section – II

### Q.4 Solve any three.

- a) Explain mode 0 and mode 1 of 8255 PPI.
- **b)** Draw flag register of 8086 microprocessor. List the features of Pentium processor.
- c) Interface 8085 with 8255 using Memory mapped I/O technique.
- d) Draw and explain block diagram of 8251.

### Q.5 Solve any two.

- a) Explain IC 8253 by considering the following parameters.
  - 1) Feature.
  - 2) Internal Block Diagram.
  - 3) Control word format.
- **b)** Interface ADC (8 bit, 8 channel) with 8085. Explain the interfacing circuit. Write ALP to read analog input and store the digital value at some memory location. Assume I/O mapped I/O technique.
- c) Interface stepper motor with 8085 microprocessor. Write an ALP to rotate stepper motor for only 180 degree angle rotation in clockwise direction then stop.

Assume step angle=7.5 degree/step.

Max. Marks: 56

12

16

12

Max. Marks: 100

Seat	
No.	

### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 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.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Marks: 20

20

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
  - 1) TRIAC can be termed as \_\_\_\_\_.
    - a) AC switch b) DC switch
      - c) Both a) and b) d) Square wave switch

### 2) Thyristor is a semiconductor switch which is \_\_\_\_\_

- a) Unidirectional b) Bidirectional
- c) AC switch d) Both b) and c)
- In commutation circuit, employed to turn off an SCR, satisfactory turn off time is obtained when \_\_\_\_\_.
  - a) Circuit turn off time is less than device turn off time
  - b) Circuit turn off time is greater than device turn off time
  - c) Circuit time constant is greater than device turn off time
  - d) Circuit time constant is less than device turn off time
- 4) In SCR angle of conduction can be varied by changing \_\_\_\_\_.
  - a) Anode voltage b) Anode current
  - c) Forward current rating d) Gatecurrent
- 5) Thyristor can be termed as \_\_\_\_\_ switch and TRIAC can be termed as \_\_\_\_\_ switch.
  - a) AC, DC b) DC, AC
  - c) AC, AC d) DC, DC
- 6) Which of the following PNPN devices are bidirectional?
  - a) TRIAC b) DIAC
  - c) Thyristor d) Both a and b

Set | F

			Set
7)	If addition of $\alpha$ 1 and $\alpha$ 2 reaches un (w.r.t. two transistor analogy of SCR	ity the )	en anode current will reach
	a) zero c) negative	b) d)	infinity none
8)	A single phase fully controlled converting diode provides of current.	erter w directi	vith highly inductive load and on of voltage and of
	a) Positive, negative	b) d)	Positive, positive
9)	Single phase full converter with high	ly indu	uctive load is quadrant
	converter. a) Single c) Four	b) d)	Two Both a) and b)
10)	In single phase full Converter with hi Inverting mode when [Alpha=	ghly iı =a]	nductive load output is in
	a) a < 90 c) a > 90	b) d)	a = 0 None
11)	<ul><li>Which chopper circuit uses saturable</li><li>a) Auxiliary commutated</li><li>c) Morgan Chopper</li></ul>	e reac b) d)	tor? Jones Chopper Load commutated
12)	A cyclo converter can be. a) Step up c) Step up or step down	b) d)	Step down None
13)	<ul><li>In a 3 phase fully controlled converte</li><li>a) 3 times the line frequency</li><li>c) 9 times the line frequency</li></ul>	er the b) d)	firing frequency is 6 times the line frequency 12 times the line frequency
14)	The cycloconverter is used in a) AC drive c) Both	b) d)	DC drive None
15)	Back up time for off line UPS depend a) Load c) Both	ds on b) d)	Battery None
16)	Chopper Converter is a) AC to DC c) DC to DC	b) d)	DC to AC AC to AC
17)	If $T_{ON}$ is kept constant and $T_{OFF}$ is var	ied th	en chopper control technique
	o) Variable frequency	<b>L</b> )	Fixed frequency

Ρ

- a) Variable frequencyc) Current limit control b)
  - Fixed frequency Both a) and b) d)



- For a step-up chopper, when the duty cycle is increased the average 18) value of the output voltage \_\_\_\_\_.
  - a) increases

- b) decreases
- c) remains the same d) none
- 19) A three-phase three pulse type controlled converter is constructed using 3 SCR devices. The circuit is supplying an R load with  $\alpha$  < 30°. As such, each SCR device would conduct for
  - a) 60° each cycle b)
  - c) 180° each cycle d)
- 120° each cycle 360° each cycle
- 20) In a single phase half-wave thyristor circuit with R load & Vs=Vm sinut, the maximum value of the load current can be given by \_\_\_\_\_.
  - a) 2Vm/R

b) Vs/R d) Vs/2

c) Vm/2

Seat	
No.	

### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain class C and class D commutation for SCR.
- **b)** Draw and explain construction, working & characteristics of DIAC.
- c) Write a short note on IGBT.
- d) Explain dv/dt protection for SCR.
- e) Compare MOSFET and IGBT.

### Q.3 Solve any three.

- a) Draw and explain the two transistor model of SCR. Derive the anode current equation.
- b) Draw circuit diagram, waveforms and explain 3-phase half wave Converter with R load.
- c) Explain construction, working & VI characteristics of TRIAC.
- d) Explain construction, working & VI characteristics of SCR.

### Section - II

### Q.4 Attempt any four.

- a) Explain the principle of dielectric heating.
- b) Explain working of online UPS with suitable block diagram.
- c) Explain working multiple pulse width modulation technique.
- d) Draw and explain single phase to single phase step down cycloconverter.
- e) Explain static DC circuit breaker.

### Q.5 Attempt any three.

- a) Explain working of series resonant inverter. Draw input and output waveform.
- **b)** Explain principle of induction heating & explain any one applications of induction heating.
- c) Draw & explain Jones and Morgan chopper.
- d) Draw & explain single phase parallel inverter with inductive load.

Max. Marks: 80

24

16

16

Seat	
No.	

### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 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. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 20 Q.1 Choose the correct alternatives from the options and rewrite the 20 sentence. Which of the following PNPN devices are bidirectional? 1) a) TRIAC DIAC b) c) Thyristor d) Both a and b If addition of  $\alpha$  1 and  $\alpha$  2 reaches unity then anode current will reach 2) (w.r.t. two transistor analogy of SCR) \_\_\_\_ a) zero infinity b) c) negative d) none A single phase fully controlled converter with highly inductive load and 3) freewheeling diode provides \_\_\_\_\_ direction of voltage and \_\_\_\_\_ of current. a) Positive, negative b) Positive, positive c) Negative, negative Negative, positive d) 4) Single phase full converter with highly inductive load is \_\_\_\_\_ quadrant converter. a) Single b) Two c) Four d) Both a) and b) 5) In single phase full Converter with highly inductive load output is in Inverting mode when \_\_\_\_\_. [Alpha=a] a) a < 90 b) a = 0c) a > 90 d) None 6) Which chopper circuit uses saturable reactor? a) Auxiliary commutated Jones Chopper b) c) Morgan Chopper d) Load commutated 7) A cyclo converter can be. a) Step up Step down b) c) Step up or step down d) None

Max. Marks: 100

			SLR-FM-769
			Set Q
8)	<ul><li>In a 3 phase fully controlled converte</li><li>a) 3 times the line frequency</li><li>c) 9 times the line frequency</li></ul>	er the b) d)	firing frequency is 6 times the line frequency 12 times the line frequency
9)	The cycloconverter is used in a) AC drive c) Both	b) d)	DC drive None
10)	Back up time for off line UPS depend a) Load c) Both	ds on b) d)	Battery None
11)	Chopper Converter is a) AC to DC c) DC to DC	b) d)	DC to AC AC to AC
12)	If T <sub>ON</sub> is kept constant and T <sub>OFF</sub> is varius a) Variable frequency c) Current limit control	ried th b) d)	nen chopper control technique Fixed frequency Both a) and b)
13)	For a step-up chopper, when the durvalue of the output voltage a) increases c) remains the same	ty cyc b) d)	le is increased the average decreases none
14)	A three-phase three pulse type cont SCR devices. The circuit is supplyin each SCR device would conduct for a) 60° each cycle c) 180° each cycle	rolled g an I  b) d)	converter is constructed using 3 R load with α < 30°. As such,  120° each cycle 360°each cycle
15)	In a single phase half-wave thyristor the maximum value of the load curre a) 2Vm/R c) Vm/2	<sup>.</sup> circu ent ca b) d)	it with R load & Vs=Vm sinωt, n be given by Vs/R Vs/2
16)	TRIAC can be termed as a) AC switch c) Both a) and b)	b) d)	DC switch Square wave switch
17)	Thyristor is a semiconductor switch a) Unidirectional c) AC switch	which b) d)	is Bidirectional Both b) and c)
18)	<ul> <li>In commutation circuit, employed to time is obtained when</li> <li>a) Circuit turn off time is less than a</li> <li>b) Circuit turn off time is greater that c) Circuit time constant is greater to the constant is greater t</li></ul>	turn device an de han de	off an SCR, satisfactory turn off e turn off time vice turn off time levice turn off time

d) Circuit time constant is less than device turn off time

\_\_\_.

Set Q

- 19) In SCR angle of conduction can be varied by changing \_
  - a) Anode voltagec) Forward current rating
- b) Anode currentd) Gatecurrent
- 20) Thyristor can be termed as \_\_\_\_\_ switch and TRIAC can be termed as \_\_\_\_\_ switch.
  - a) AC, DC
  - c) AC, AC

- b) DC, AC
- d) DC, DC

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### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain class C and class D commutation for SCR.
- **b)** Draw and explain construction, working & characteristics of DIAC.
- c) Write a short note on IGBT.
- d) Explain dv/dt protection for SCR.
- e) Compare MOSFET and IGBT.

### Q.3 Solve any three.

- a) Draw and explain the two transistor model of SCR. Derive the anode current equation.
- b) Draw circuit diagram, waveforms and explain 3-phase half wave Converter with R load.
- c) Explain construction, working & VI characteristics of TRIAC.
- d) Explain construction, working & VI characteristics of SCR.

### Section - II

### Q.4 Attempt any four.

- a) Explain the principle of dielectric heating.
- b) Explain working of online UPS with suitable block diagram.
- c) Explain working multiple pulse width modulation technique.
- d) Draw and explain single phase to single phase step down cycloconverter.
- e) Explain static DC circuit breaker.

### Q.5 Attempt any three.

- a) Explain working of series resonant inverter. Draw input and output waveform.
- **b)** Explain principle of induction heating & explain any one applications of induction heating.
- c) Draw & explain Jones and Morgan chopper.
- d) Draw & explain single phase parallel inverter with inductive load.

Max. Marks: 80

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24

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16

Seat	
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### T.E. (Part – II) (Old) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering** INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 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.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

Marks: 20

Q.1 Choose the correct alternatives from the options and rewrite the 20 sentence. Which chopper circuit uses saturable reactor? 1) a) Auxiliary commutated Jones Chopper b) c) Morgan Chopper d) Load commutated

b)

- A cyclo converter can be. 2)
  - a) Step up Step down b) c) Step up or step down d) None

#### 3) In a 3 phase fully controlled converter the firing frequency is \_\_\_\_\_.

- a) 3 times the line frequency
- c) 9 times the line frequency
- d) 12 times the line frequency

6 times the line frequency

- The cycloconverter is used in \_\_\_\_\_ 4)
  - a) AC drive b) DC drive Both None c) d)
- Back up time for off line UPS depends on \_ 5)
  - a) Load Battery b)
  - c) Both None d)
- 6) Chopper Converter is . a) AC to DC DC to AC b)
  - c) DC to DC AC to AC d)
- If  $T_{ON}$  is kept constant and  $T_{OFF}$  is varied then chopper control technique 7) is
  - a) Variable frequency b) Fixed frequency
  - c) Current limit control Both a) and b) d)

Max. Marks: 100

Set

			SLR-FM-7	69
			Set	R
8)	For a step-up chopper, when the dut value of the output voltage a) increases c) remains the same	b) d)	le is increased the average decreases none	
9)	A three-phase three pulse type contr SCR devices. The circuit is supplying each SCR device would conduct for a) 60° each cycle c) 180° each cycle	rolled g an F  b) d)	converter is constructed using 3 R load with $\alpha$ < 30°. As such,  120° each cycle 360° each cycle	
10)	In a single phase half-wave thyristor the maximum value of the load curre a) 2Vm/R c) Vm/2	circui ent ca b) d)	it with R load & Vs=Vm sinωt, n be given by Vs/R Vs/2	
11)	TRIAC can be termed as a) AC switch c) Both a) and b)	b) d)	DC switch Square wave switch	
12)	<ul><li>Thyristor is a semiconductor switch v</li><li>a) Unidirectional</li><li>c) AC switch</li></ul>	which b) d)	is Bidirectional Both b) and c)	
13)	<ul> <li>In commutation circuit, employed to time is obtained when</li> <li>a) Circuit turn off time is less than of b) Circuit turn off time is greater that c) Circuit time constant is greater that d) Circuit time constant is less than</li> </ul>	turn o device an de han d i devie	off an SCR, satisfactory turn off e turn off time vice turn off time evice turn off time ce turn off time	
14)	In SCR angle of conduction can be v a) Anode voltage c) Forward current rating	varied b) d)	by changing Anode current Gatecurrent	
15)	Thyristor can be termed as sw switch. a) AC, DC c) AC, AC	vitch a b) d)	and TRIAC can be termed as DC, AC DC, DC	
16)	Which of the following PNPN devices a) TRIAC c) Thyristor	s are b) d)	bidirectional? DIAC Both a and b	
17)	If addition of α 1 and α 2 reaches un (w.r.t. two transistor analogy of SCR) a) zero c) negative	ity the ) b) d)	en anode current will reach  infinity none	

# Set R

- A single phase fully controlled converter with highly inductive load and freewheeling diode provides \_\_\_\_\_ direction of voltage and \_\_\_\_\_ of current.
  - a) Positive, negative b) Positive, positive
  - c) Negative, negative d) Negative, positive
- 19) Single phase full converter with highly inductive load is \_\_\_\_\_ quadrant converter.
  - a) Single b) Two
  - c) Four d) Both a) and b)
- 20) In single phase full Converter with highly inductive load output is in Inverting mode when \_\_\_\_\_. [Alpha=a]
  - a) a < 90 b) a = 0
  - c) a > 90 d) None

Seat	
No.	

### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain class C and class D commutation for SCR.
- **b)** Draw and explain construction, working & characteristics of DIAC.
- c) Write a short note on IGBT.
- d) Explain dv/dt protection for SCR.
- e) Compare MOSFET and IGBT.

### Q.3 Solve any three.

- a) Draw and explain the two transistor model of SCR. Derive the anode current equation.
- b) Draw circuit diagram, waveforms and explain 3-phase half wave Converter with R load.
- c) Explain construction, working & VI characteristics of TRIAC.
- d) Explain construction, working & VI characteristics of SCR.

### Section - II

### Q.4 Attempt any four.

- a) Explain the principle of dielectric heating.
- b) Explain working of online UPS with suitable block diagram.
- c) Explain working multiple pulse width modulation technique.
- d) Draw and explain single phase to single phase step down cycloconverter.
- e) Explain static DC circuit breaker.

### Q.5 Attempt any three.

- a) Explain working of series resonant inverter. Draw input and output waveform.
- **b)** Explain principle of induction heating & explain any one applications of induction heating.
- c) Draw & explain Jones and Morgan chopper.
- d) Draw & explain single phase parallel inverter with inductive load.

Max. Marks: 80

24

16

16

Seat	
No.	

### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 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. MCQ/Objective Type Questions Duration: 30 Minutes Q.1 Choose the correct alternatives from the options and rewrite the sentence. 1) Chopper Converter is \_\_\_\_\_.

- a) AC to DCb) DC to ACc) DC to DCd) AC to AC
- If T<sub>ON</sub> is kept constant and T<sub>OFF</sub> is varied then chopper control technique is \_\_\_\_\_.
  - a) Variable frequency b) Fixed frequency
  - c) Current limit control d) Both a) and b)
- For a step-up chopper, when the duty cycle is increased the average value of the output voltage \_\_\_\_\_.
  - a) increases b) decreases
  - c) remains the same d) none
- A three-phase three pulse type controlled converter is constructed using 3 SCR devices. The circuit is supplying an R load with α < 30°. As such, each SCR device would conduct for \_\_\_\_\_.
  - a) 60° each cycle b) 120° each cycle
  - c) 180° each cycle d) 360° each cycle
- 5) In a single phase half-wave thyristor circuit with R load & Vs=Vm sinωt, the maximum value of the load current can be given by \_\_\_\_\_.
  - a) 2Vm/R b) Vs/R
  - c) Vm/2 d) Vs/2
- 6) TRIAC can be termed as \_\_\_\_\_.
  - a) AC switch b) DC switch
  - c) Both a) and b) d) Square wave switch
- 7) Thyristor is a semiconductor switch which is \_\_\_\_\_.
  - a) Unidirectionalb) Bidirectionalc) AC switchd) Both b) and c)

Max. Marks: 100



Set	S
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8)	In co time a) b) c) d)	ommutation circuit, employed to is obtained when Circuit turn off time is less than of Circuit turn off time is greater that Circuit time constant is greater that Circuit time constant is less than	turn o device an dev nan de nan devid	ff an SCR, satisfactory turn off turn off time vice turn off time evice turn off time ce turn off time
9)	In S a) c)	CR angle of conduction can be v Anode voltage Forward current rating	aried b) d)	by changing Anode current Gatecurrent
10)	Thyı a) c)	ristor can be termed as sw switch. AC, DC AC, AC	vitch a b) d)	and TRIAC can be termed as DC, AC DC, DC
11)	Whie a) c)	ch of the following PNPN devices TRIAC Thyristor	s are b) d)	bidirectional? DIAC Both a and b
12)	lf ad (w.r. a) c)	ldition of α 1 and α 2 reaches un t. two transistor analogy of SCR zero negative	ity the ) b) d)	n anode current will reach  infinity none
13)	A sir free curre a) c)	ngle phase fully controlled conve wheeling diode provides c ent. Positive, negative Negative, negative	rter w lirecti b) d)	ith highly inductive load and on of voltage and of Positive, positive Negative, positive
14)	Sing conv a) c)	le phase full converter with high verter. Single Four	b) d)	uctive load is quadrant Two Both a) and b)
15)	In si Inve a) c)	ngle phase full Converter with hi rting mode when [Alpha= a < 90 a > 90	ghly iı ₌a] b) d)	nductive load output is in a = 0 None
16)	Whie a) c)	ch chopper circuit uses saturable Auxiliary commutated Morgan Chopper	e reac b) d)	tor? Jones Chopper Load commutated
17)	A cy a) c)	rclo converter can be. Step up Step up or step down	b) d)	Step down None

- Set S
- In a 3 phase fully controlled converter the firing frequency is \_\_\_\_\_. 18)
  - a) 3 times the line frequency
- 6 times the line frequency b) d)

DC drive

.

- c) 9 times the line frequency
- 12 times the line frequency

#### The cycloconverter is used in \_\_\_\_\_. 19)

- a) AC drive b)
- c) Both d) None
- Back up time for off line UPS depends on \_ 20)
  - Battery a) Load b) c) Both d) None

Seat	
No.	

### T.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Time: 10:00 AM To 01:00 PM

**Instructions:** 1) All questions are compulsory.

2) Figures to the right indicate full marks.

### Section – I

### Q.2 Solve any four.

- a) Explain class C and class D commutation for SCR.
- **b)** Draw and explain construction, working & characteristics of DIAC.
- c) Write a short note on IGBT.
- d) Explain dv/dt protection for SCR.
- e) Compare MOSFET and IGBT.

### Q.3 Solve any three.

- a) Draw and explain the two transistor model of SCR. Derive the anode current equation.
- b) Draw circuit diagram, waveforms and explain 3-phase half wave Converter with R load.
- c) Explain construction, working & VI characteristics of TRIAC.
- d) Explain construction, working & VI characteristics of SCR.

### Section - II

### Q.4 Attempt any four.

- a) Explain the principle of dielectric heating.
- b) Explain working of online UPS with suitable block diagram.
- c) Explain working multiple pulse width modulation technique.
- d) Draw and explain single phase to single phase step down cycloconverter.
- e) Explain static DC circuit breaker.

### Q.5 Attempt any three.

- a) Explain working of series resonant inverter. Draw input and output waveform.
- **b)** Explain principle of induction heating & explain any one applications of induction heating.
- c) Draw & explain Jones and Morgan chopper.
- d) Draw & explain single phase parallel inverter with inductive load.

Max. Marks: 80

24

16

16

### B.E. (Part – II) (Old) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering FUZZY LOGIC**

Day & Date: Wednesday, 27-11-2019 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.
  - 3) Assume suitable data if necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

- Implication connective is equivalent to Fuzzy relation R as 1)
  - a)  $(A \times B) \cup (\overline{A} \times Y)$
  - c)  $(A \times B) \cap (\overline{A} \times Y)$
- 2) A/B is defined as
  - a) The collection of all elements in the universe that reside in A & don't reside in B
  - b) The collection of all elements in the universe that reside in B & don't reside in A

b)

d)

- c) Null set
- d) None
- 3) Fuzzy system are .
  - a) Control system
  - c) Both (a) and (b)

b) Rule based system d) None

Axiom of Contradiction

- 4) A U A' = X is called as
  - a) Axiom of excluded middle
  - c) Union operation
- 5) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have \_
  - a) Infinite membership grade in A
  - b) Non zero membership grade in A
  - c) zero membership grade in A
  - d) None
- The induction is performed by \_\_\_\_\_ 6)
  - a) Standard value
  - c) Entropy minimizations d)
- Mean value calculations b)
  - None

None

- d) None
- b)  $(A \times B) \cup (A \times Y)$



Max. Marks: 100

Marks: 20

	Set F
7)	Centroid method is also known asa) Centre of areab) Centre of gravityc) Both (a) and (b)d) None
8)	The optimum partition, U*, to be the partition that producesa) Max value of J functionb) Min value of J functionc) Value of J functiond) None
9)	Family of Fuzzy partition matrices, $M_{FC}$ , for the classification involving C classes and n data points a) $\{(U \mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{k=1}^{C} < n; \}$ b) $\{(U \mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{i=1}^{C} < n; \}$ c) $\{(U \mu ik \in [0,1]; \sum_{i=1}^{n} \mu ik = 1; 0 < \sum_{k=1}^{C} < n; \}$ d) None
10)	Fuzzy relation R based on, IF A, THEN B asa) $B \rightarrow A$ b) $A \rightarrow B$ c) $A \rightarrow \overline{B}$ d) None
11)	<ul> <li>Cognitive maps graphically describes a system in terms of</li> <li>a) Concept variables</li> <li>b) Concept variables and causal relations</li> <li>c) Causal relations</li> <li>d) None</li> </ul>
12)	In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a a) Membership function b) IF-THEN rules c) linguistic labels d) None
13)	The physician's medical knowledge is represented as a fuzzy relationbetweena) Disease & patientb) Symptoms & patientc) Both a and bd) None
14)	Chromosomes x & y, to which crossover operation is applied is calleda) Mutationb) Matesc) Fitnessd) None
15)	For Nontransitive ranking, we introduce a special notion ofa) Transitiveb) Relativityc) Ordinal rankingd) None
16)	Interval valued fuzzy sets can further be generalized as a) Type II fuzzy sets b) Ordinary fuzzy sets c) Fuzzy power sets d) None
17)	Rank ordering ambiguity demonstrated for both fuzzy and variables.a) Staticb) Constantc) Randomd) None

Set P

- In fuzzy expert systems, the knowledge is usually represented by the set of \_\_\_\_\_.
  - a) Fuzzy production rules
- b) Fuzzy nos d) None
- c) Fuzzy coefficients d)
- 19) The model proposes two types of relation exist between symptoms and disease are\_\_\_\_\_.
  - a) Occurrence relation
- b) Confirmability relation
- c) Both (a) and (b) d) All
- 20) Fuzzy regression analysis uses \_\_\_\_\_ to represent the coefficient.
  - a) Fuzzy number b) Fuzzy coefficient
  - c) Fuzzy function

b) Fuzzy coefficiencyd) None

### B.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

#### Q.2 Attempt any four.

Seat No.

- a) Consider the following two discrete fuzzy sets, which are defined on
  - universe  $X = \{-5, 5\}$ : Construct relation for the rule IF A THEN B

$$A = Zero = \left\{ \frac{0.2}{-3} + \frac{0.5}{-1} + \frac{1.0}{0} + \frac{0.5}{1} + \frac{0.1}{2} \right\}$$
  

$$B = posisitive \ medium = \left\{ \frac{0}{0} + \frac{0.7}{1} + \frac{1.0}{2} + \frac{0.5}{3} + \frac{0.2}{4} \right\}$$

- b) Perform the following operations on intervals.
  - 1) [3, 2] + [3, 4]
  - **2)** [4, 2] × [1, 2]
- c) Differentiate between fuzzy sets and crisp sets.
- d) Write a short note on C means clustering.
- e) Find the Cartesian product represented by the relation  $R = X \times Y$

$$X = \left\{ \frac{0.2}{10} + \frac{0.5}{20} + \frac{0.8}{40} + \frac{1.0}{60} + \frac{0.6}{80} + \frac{0.1}{100} \right\}$$
$$Y = \left\{ \frac{0.3}{0.5} + \frac{0.6}{1} + \frac{0.9}{1.5} + \frac{1.0}{4} + \frac{0.6}{8} + \frac{0.3}{20} \right\}$$

- f) Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables: Education of people
  - 1) Fairly educated
  - 2) Educated
  - 3) Highly educated
  - 4) Not highly educated
  - 5) More or less educated

Max. Marks: 80

# Set P

20

20

#### Q.3 Answer the Following.

a) A fuzzy tolerance relation,  $\stackrel{R}{\sim}$ , is reflexive and symmetric. Find the equivalence

relation  $\stackrel{R_e}{\sim}$  and then classify it according to  $\lambda$ -cut levels = {0.7, 0.6, 0.5}.

 $R = \begin{bmatrix} 1 & 0.8 & 0 & 0.2 & 0.1 \\ 0.8 & 1 & 0.9 & 0 & 0.4 \\ 0 & 0.9 & 1 & 0 & 0.3 \\ 0.2 & 0 & 0 & 1 & 0.5 \\ 0.1 & 0.4 & 0.3 & 0.5 & 1 \end{bmatrix}$ 

**b)** In fuzzy automata, generate fuzzy input and output states under following conditions.

Output relation  $R = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$  and state transition relation  $S = \begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}$ 

With initial state  $C^1 = \begin{bmatrix} 1 & 0.7 & 0.6 & 0.4 \end{bmatrix}$ Inputs  $A1 = \begin{bmatrix} 0.4 & 0 \end{bmatrix}$   $A2 = \begin{bmatrix} 1 & 0 \end{bmatrix}$   $A3 = \begin{bmatrix} 1 & 0.7 \end{bmatrix}$ OR

b) What is defuzzification? Explain methods of defuzzification?

#### Section – II

#### Q.4 Answer the following.

a) A manufacturing company is planning to purchase a lathe and is assessing the proposals from four lathe manufacturers. The company has developed a reciprocal relation for the four manufacturers based on the speed of delivery of the lathes and the cost. The relation is

 $R = \begin{bmatrix} 0 & 0.1 & 0.7 & 0.2 \\ 0.9 & 0 & 0.6 & 1 \\ 0.3 & 0.4 & 0 & 0.5 \\ 0.8 & 0 & 0.5 & 0 \end{bmatrix}$ 

Calculate the degree of preference measures, and the distance to Type I, Type II consensus. Explain the differences between the distances to the three consensuses.

Set P

- a) Explain following
  - 1) Fuzzy linear programming
  - 2) Nontransitive ranking
- b) Explain FSPC for measurement and attribute SPC.

#### Q.5 Attempt any four.

- a) Write a short note on Type 2 fuzzy.
- **b)** Explain application of fuzzy in Genetic.
- c) Explain fuzzy ranking method.
- d) Explain simple fuzzy control system.
- e) Explain Fuzzy Cognitive Map.

Set Q

### B.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 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.
- 3) Assume suitable 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. 20

- The induction is performed by \_\_\_\_\_
  - a) Standard value b) Mean value calculations
  - c) Entropy minimizations d) None
- 2) Centroid method is also known as \_\_\_\_\_.
   a) Centre of area
   b) Centre of gravity
  - c) Both (a) and (b) d) None
- 3) The optimum partition, U\*, to be the partition that produces \_\_\_\_\_.
  - a) Max value of J function
- b) Min value of J function
- c) Value of J function d) None
- Family of Fuzzy partition matrices, M<sub>FC</sub>, for the classification involving C classes and n data points \_\_\_\_\_.
  - a)  $\{(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{k=1}^{C} < n; \}$
  - b)  $\{(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{i=1}^{C} < n; \}$
  - c)  $\{(U|\mu ik \in [0,1]; \sum_{i=1}^{n} \mu ik = 1; 0 < \sum_{k=1}^{c} < n; \}$
  - d) None
- 5) Fuzzy relation R based on, IF A, THEN B as \_\_\_\_\_.

a)	$B \rightarrow A$	b)	$A \rightarrow B$
C)	$A \rightarrow \overline{B}$	d)	None

- 6) Cognitive maps graphically describes a system in terms of \_\_\_\_\_.
  - a) Concept variables
  - b) Concept variables and causal relations
  - c) Causal relations
  - d) None

Marks: 20

Max. Marks: 100

	Set Q
7)	In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a a) Membership function b) IF-THEN rules c) linguistic labels d) None
8)	The physician's medical knowledge is represented as a fuzzy relationbetweena) Disease & patientb) Symptoms & patientc) Both a and bd) None
9)	Chromosomes x & y, to which crossover operation is applied is calleda) Mutationb) Matesc) Fitnessd) None
10)	For Nontransitive ranking, we introduce a special notion ofa) Transitiveb) Relativityc) Ordinal rankingd) None
11)	Interval valued fuzzy sets can further be generalized asa) Type II fuzzy setsb) Ordinary fuzzy setsc) Fuzzy power setsd) None
12)	Rank ordering ambiguity demonstrated for both fuzzy and variables.a) Staticb) Constantc) Randomd) None
13)	In fuzzy expert systems, the knowledge is usually represented by the set of a) Fuzzy production rules b) Fuzzy nos c) Fuzzy coefficients d) None
14)	The model proposes two types of relation exist between symptoms and disease area) Occurrence relationb) Confirmability relationc) Both (a) and (b)d) All
15)	Fuzzy regression analysis uses to represent the coefficient.a) Fuzzy numberb) Fuzzy coefficientc) Fuzzy functiond) None
16)	Implication connective is equivalent to Fuzzy relation R asa) $(A \times B) \cup (\bar{A} \times Y)$ b) $(A \times B) \cup (A \times Y)$ c) $(A \times B) \cap (\bar{A} \times Y)$ d) None



- 17) A/B is defined as \_\_\_\_\_.
  - a) The collection of all elements in the universe that reside in A & don't reside in B
  - b) The collection of all elements in the universe that reside in B & don't reside in A
  - c) Null set
  - d) None
- 18) Fuzzy system are \_\_\_\_\_.
  - a) Control system
  - c) Both (a) and (b)

- b) Rule based system
- d) None
- 19) A U A' = X is called as \_\_\_\_\_. a) Axiom of excluded middle
- b) Axiom of Contradiction
- c) Union operation
- d) None
- 20) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have \_\_\_\_\_.
  - a) Infinite membership grade in A
  - b) Non zero membership grade in A
  - c) zero membership grade in A
  - d) None

## Seat No.

### B.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

### Q.2 Attempt any four.

- a) Consider the following two discrete fuzzy sets, which are defined on
  - universe  $X = \{-5, 5\}$ : Construct relation for the rule IF A THEN B

$$A = Zero = \left\{ \frac{0.2}{-3} + \frac{0.5}{-1} + \frac{1.0}{0} + \frac{0.5}{1} + \frac{0.1}{2} \right\}$$
  

$$B = posisitive \ medium = \left\{ \frac{0}{0} + \frac{0.7}{1} + \frac{1.0}{2} + \frac{0.5}{3} + \frac{0.2}{4} \right\}$$

- b) Perform the following operations on intervals.
  - 1) [3,2] + [3,4]
  - **2)** [4, 2] × [1, 2]
- c) Differentiate between fuzzy sets and crisp sets.
- d) Write a short note on C means clustering.
- e) Find the Cartesian product represented by the relation  $R = X \times Y$

$$X = \left\{ \frac{0.2}{10} + \frac{0.5}{20} + \frac{0.8}{40} + \frac{1.0}{60} + \frac{0.6}{80} + \frac{0.1}{100} \right\}$$
$$Y = \left\{ \frac{0.3}{0.5} + \frac{0.6}{1} + \frac{0.9}{1.5} + \frac{1.0}{4} + \frac{0.6}{8} + \frac{0.3}{20} \right\}$$

- **f)** Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables: Education of people
  - 1) Fairly educated
  - 2) Educated
  - 3) Highly educated
  - 4) Not highly educated
  - 5) More or less educated

Max. Marks: 80

20



# Set Q

20

20

#### Q.3 Answer the Following.

a) A fuzzy tolerance relation,  $\stackrel{R}{\sim}$ , is reflexive and symmetric. Find the equivalence

relation  $\stackrel{R_e}{\sim}$  and then classify it according to  $\lambda$ -cut levels = {0.7, 0.6, 0.5}.

 $R = \begin{bmatrix} 1 & 0.8 & 0 & 0.2 & 0.1 \\ 0.8 & 1 & 0.9 & 0 & 0.4 \\ 0 & 0.9 & 1 & 0 & 0.3 \\ 0.2 & 0 & 0 & 1 & 0.5 \\ 0.1 & 0.4 & 0.3 & 0.5 & 1 \end{bmatrix}$ 

**b)** In fuzzy automata, generate fuzzy input and output states under following conditions.

Output relation  $R = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$  and state transition relation  $S = \begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}$ 

With initial state  $C^1 = \begin{bmatrix} 1 & 0.7 & 0.6 & 0.4 \end{bmatrix}$ Inputs  $A1 = \begin{bmatrix} 0.4 & 0 \end{bmatrix}$   $A2 = \begin{bmatrix} 1 & 0 \end{bmatrix}$   $A3 = \begin{bmatrix} 1 & 0.7 \end{bmatrix}$ OR

b) What is defuzzification? Explain methods of defuzzification?

#### Section – II

#### Q.4 Answer the following.

a) A manufacturing company is planning to purchase a lathe and is assessing the proposals from four lathe manufacturers. The company has developed a reciprocal relation for the four manufacturers based on the speed of delivery of the lathes and the cost. The relation is

 $R = \begin{bmatrix} 0 & 0.1 & 0.7 & 0.2 \\ 0.9 & 0 & 0.6 & 1 \\ 0.3 & 0.4 & 0 & 0.5 \\ 0.8 & 0 & 0.5 & 0 \end{bmatrix}$ 

Calculate the degree of preference measures, and the distance to Type I, Type II consensus. Explain the differences between the distances to the three consensuses.



- a) Explain following
  - 1) Fuzzy linear programming
  - 2) Nontransitive ranking
- b) Explain FSPC for measurement and attribute SPC.

#### Q.5 Attempt any four.

- a) Write a short note on Type 2 fuzzy.
- **b)** Explain application of fuzzy in Genetic.
- c) Explain fuzzy ranking method.
- d) Explain simple fuzzy control system.
- e) Explain Fuzzy Cognitive Map.

Seat	
No.	

### B.E. (Part – II) (Old) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering FUZZY LOGIC**

Day & Date: Wednesday, 27-11-2019 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.
  - 3) Assume suitable data if necessary.

### **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

- Cognitive maps graphically describes a system in terms of \_\_\_\_\_. 1)
  - a) Concept variables
  - b) Concept variables and causal relations
  - c) Causal relations
  - d) None

2) In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a

- a) Membership function **IF-THEN** rules b)
- c) linguistic labels d) None
- 3) The physician's medical knowledge is represented as a fuzzy relation between
  - a) Disease & patient

c) Both a and b

- b) Symptoms & patient d) None
- 4) Chromosomes x & y, to which crossover operation is applied is called \_\_\_\_\_.
  - a) Mutation Mates b)
  - c) Fitness d) None

5) For Nontransitive ranking, we introduce a special notion of .

- a) Transitive Relativity b)
- c) Ordinal ranking d) None
- Interval valued fuzzy sets can further be generalized as . 6)
  - Ordinary fuzzy sets b) None

d)

c) Fuzzy power sets

a) Type II fuzzy sets

- Rank ordering ambiguity demonstrated for both fuzzy and \_\_\_\_\_ variables. 7)
  - a) Static b) Constant
  - c) Random d) None

**SLR-FM-770** 



Max. Marks: 100

Marks: 20

Set R

8) In fuzzy expert systems, the knowledge is usually represented by the set of \_\_\_\_\_.

b)

Fuzzy nos

- a) Fuzzy production rules
- c) Fuzzy coefficients d) None
- 9) The model proposes two types of relation exist between symptoms and disease are .
  - a) Occurrence relation b) Confirmability relation
  - c) Both (a) and (b) d) All

#### Fuzzy regression analysis uses \_\_\_\_\_ to represent the coefficient. 10)

- a) Fuzzy number b) Fuzzy coefficient
  - c) Fuzzy function d) None
- 11) Implication connective is equivalent to Fuzzy relation R as
  - a)  $(A \times B) \cup (\overline{A} \times Y)$ c)  $(A \times B) \cap (\overline{A} \times Y)$ b)  $(A \times B) \cup (A \times Y)$ d) None
- A/B is defined as 12)
  - a) The collection of all elements in the universe that reside in A & don't reside in B
  - b) The collection of all elements in the universe that reside in B & don't reside in A

d)

- c) Null set
- d) None
- 13) Fuzzy system are \_\_\_\_\_.
  - a) Control system
  - c) Both (a) and (b)
- 14) A U A' = X is called as \_\_\_\_
  - a) Axiom of excluded middle
  - c) Union operation
- b) Axiom of Contradiction

b) Rule based system

None

- d) None
- 15) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have .
  - a) Infinite membership grade in A
  - b) Non zero membership grade in A
  - c) zero membership grade in A
  - d) None
- The induction is performed by \_\_\_\_ 16)
  - a) Standard value Mean value calculations b)
  - c) Entropy minimizations d) None
- Centroid method is also known as \_\_\_\_ 17)
  - Centre of gravity a) Centre of area b) c) Both (a) and (b)
    - None d)

Set R

- The optimum partition, U\*, to be the partition that produces \_\_\_\_ 18)
  - a) Max value of J function Min value of J function b)
  - c) Value of J function
- d) None
- Family of Fuzzy partition matrices, M<sub>FC</sub>, for the classification involving C 19) classes and n data points \_ \_\_\_.
  - a) { $(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{k=1}^{C} < n;$ } b) { $(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{i=1}^{C} < n;$ } c) { $(U|\mu ik \in [0,1]; \sum_{i=1}^{n} \mu ik = 1; 0 < \sum_{k=1}^{C} < n;$ }

  - d) None
- Fuzzy relation R based on, IF A, THEN B as \_\_\_\_\_. 20)
  - a)  $B \rightarrow A$  $A \rightarrow B$ b)
  - c)  $A \rightarrow \overline{B}$ d) None

## Seat No.

### B.E. (Part – II) (Old) Examination Nov/Dec-2019 Electronics & Telecommunication Engineering FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

### Q.2 Attempt any four.

- a) Consider the following two discrete fuzzy sets, which are defined on
  - universe  $X = \{-5, 5\}$ : Construct relation for the rule IF A THEN B

$$A = Zero = \left\{ \frac{0.2}{-3} + \frac{0.5}{-1} + \frac{1.0}{0} + \frac{0.5}{1} + \frac{0.1}{2} \right\}$$
  

$$B = posisitive \ medium = \left\{ \frac{0}{0} + \frac{0.7}{1} + \frac{1.0}{2} + \frac{0.5}{3} + \frac{0.2}{4} \right\}$$

- b) Perform the following operations on intervals.
  - 1) [3,2] + [3,4]
  - **2)** [4, 2] × [1, 2]
- c) Differentiate between fuzzy sets and crisp sets.
- d) Write a short note on C means clustering.
- e) Find the Cartesian product represented by the relation  $R = X \times Y$

$$X = \left\{ \frac{0.2}{10} + \frac{0.5}{20} + \frac{0.8}{40} + \frac{1.0}{60} + \frac{0.6}{80} + \frac{0.1}{100} \right\}$$
$$Y = \left\{ \frac{0.3}{0.5} + \frac{0.6}{1} + \frac{0.9}{1.5} + \frac{1.0}{4} + \frac{0.6}{8} + \frac{0.3}{20} \right\}$$

- **f)** Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables: Education of people
  - 1) Fairly educated
  - 2) Educated
  - 3) Highly educated
  - 4) Not highly educated
  - 5) More or less educated

Max. Marks: 80

# SLR-FM-770


# Set R

20

20

### Q.3 Answer the Following.

a) A fuzzy tolerance relation,  $\stackrel{R}{\sim}$ , is reflexive and symmetric. Find the equivalence

relation  $\stackrel{R_e}{\sim}$  and then classify it according to  $\lambda$ -cut levels = {0.7, 0.6, 0.5}.

 $R = \begin{bmatrix} 1 & 0.8 & 0 & 0.2 & 0.1 \\ 0.8 & 1 & 0.9 & 0 & 0.4 \\ 0 & 0.9 & 1 & 0 & 0.3 \\ 0.2 & 0 & 0 & 1 & 0.5 \\ 0.1 & 0.4 & 0.3 & 0.5 & 1 \end{bmatrix}$ 

**b)** In fuzzy automata, generate fuzzy input and output states under following conditions.

Output relation  $R = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$  and state transition relation  $S = \begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}$ 

With initial state  $C^1 = \begin{bmatrix} 1 & 0.7 & 0.6 & 0.4 \end{bmatrix}$ Inputs  $A1 = \begin{bmatrix} 0.4 & 0 \end{bmatrix}$   $A2 = \begin{bmatrix} 1 & 0 \end{bmatrix}$   $A3 = \begin{bmatrix} 1 & 0.7 \end{bmatrix}$ OR

b) What is defuzzification? Explain methods of defuzzification?

### Section – II

### Q.4 Answer the following.

a) A manufacturing company is planning to purchase a lathe and is assessing the proposals from four lathe manufacturers. The company has developed a reciprocal relation for the four manufacturers based on the speed of delivery of the lathes and the cost. The relation is

 $R = \begin{bmatrix} 0 & 0.1 & 0.7 & 0.2 \\ 0.9 & 0 & 0.6 & 1 \\ 0.3 & 0.4 & 0 & 0.5 \\ 0.8 & 0 & 0.5 & 0 \end{bmatrix}$ 

Calculate the degree of preference measures, and the distance to Type I, Type II consensus. Explain the differences between the distances to the three consensuses.

Set R

- a) Explain following
  - 1) Fuzzy linear programming
  - 2) Nontransitive ranking
- b) Explain FSPC for measurement and attribute SPC.

### Q.5 Attempt any four.

- a) Write a short note on Type 2 fuzzy.
- **b)** Explain application of fuzzy in Genetic.
- c) Explain fuzzy ranking method.
- d) Explain simple fuzzy control system.
- e) Explain Fuzzy Cognitive Map.

No.	
Seat	

## B.E. (Part – II) (Old) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering FUZZY LOGIC**

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

a) Static

**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.

## **MCQ/Objective Type Questions**

**Duration: 30 Minutes** 

#### Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

- Interval valued fuzzy sets can further be generalized as \_\_\_\_ 1) a) Type II fuzzy sets
  - Ordinary fuzzy sets b)
  - c) Fuzzy power sets d) None
- 2) Rank ordering ambiguity demonstrated for both fuzzy and \_\_\_\_\_ variables.
  - Constant b)
  - c) Random d) None
- In fuzzy expert systems, the knowledge is usually represented by the set 3) of .
  - a) Fuzzy production rules c) Fuzzy coefficients
    - b) Fuzzy nos d) None
- The model proposes two types of relation exist between symptoms and 4) disease are\_\_\_\_\_.
  - a) Occurrence relation
  - b) Confirmability relation c) Both (a) and (b) d) All
- Fuzzy regression analysis uses \_\_\_\_\_ to represent the coefficient. 5)
  - a) Fuzzy number b) Fuzzy coefficient
    - c) Fuzzy function d) None
- Implication connective is equivalent to Fuzzy relation R as 6)
  - a)  $(A \times B) \cup (\overline{A} \times Y)$
- b)  $(A \times B) \cup (A \times Y)$
- c)  $(A \times B) \cap (\overline{A} \times Y)$
- d) None

Marks: 20

Max. Marks: 100



Set S A/B is defined as . a) The collection of all elements in the universe that reside in A & don't reside in B b) The collection of all elements in the universe that reside in B & don't reside in A c) Null set d) None Fuzzy system are \_\_\_\_\_. Rule based system a) Control system b) c) Both (a) and (b) d) None A U A' = X is called as Axiom of Contradiction a) Axiom of excluded middle b) c) Union operation None d) The support of a fuzzy set A within a universal set X is the crisp set that contain all elements of X that have a) Infinite membership grade in A b) Non zero membership grade in A c) zero membership grade in A d) None The induction is performed by \_\_\_\_\_ a) Standard value Mean value calculations b) c) Entropy minimizations d) None Centroid method is also known as \_ Centre of gravity a) Centre of area b) c) Both (a) and (b) d) None The optimum partition, U<sup>\*</sup>, to be the partition that produces \_\_\_\_ Min value of J function a) Max value of J function b) c) Value of J function d) None Family of Fuzzy partition matrices, M<sub>FC</sub>, for the classification involving C classes and n data points \_\_\_\_\_. a)  $\{(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{k=1}^{C} < n; \}$ b)  $\{(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{i=1}^{C} < n; \}$ c) { $(U|\mu ik \in [0,1]; \sum_{i=1}^{n} \mu ik = 1; 0 < \sum_{k=1}^{c} < n;$ } d) None Fuzzy relation R based on, IF A, THEN B as \_\_\_\_\_

15) Fuzzy relation R based on, IF A, THEN B as \_\_\_\_\_ a)  $B \rightarrow A$  b)  $A \rightarrow B$ 

7)

8)

9)

10)

11)

12)

13)

14)

c)  $A \rightarrow \overline{B}$  d) None

**SLR-FM-770** 

Set S

- Cognitive maps graphically describes a system in terms of \_\_\_\_\_. 16)
  - a) Concept variables
  - b) Concept variables and causal relations
  - c) Causal relations
  - d) None
- 17) In simple fuzzy logic controllers, partition the universe of discourse by each variable into a number of fuzzy subsets, assigning each a \_\_\_\_\_.
  - a) Membership function
- b) **IF-THEN** rules
- c) linguistic labels d) None
- 18) The physician's medical knowledge is represented as a fuzzy relation between \_\_\_\_\_.
  - a) Disease & patient
- Symptoms & patient b)
- c) Both a and b
- d) None

### 19) Chromosomes x & y, to which crossover operation is applied is called \_\_\_\_\_.

- a) Mutation b) Mates c) Fitness
  - d) None
- For Nontransitive ranking, we introduce a special notion of \_\_\_\_\_. 20)
  - a) Transitive
  - c) Ordinal ranking
- Relativity b)
- d) None

# Seat

## B.E. (Part – II) (Old) Examination Nov/Dec-2019 **Electronics & Telecommunication Engineering FUZZY LOGIC**

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

**Instructions:** 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

### Section – I

### Q.2 Attempt any four.

No.

- Consider the following two discrete fuzzy sets, which are defined on a)
  - universe  $X = \{-5, 5\}$ : Construct relation for the rule IF A THEN B

$$A = Zero = \left\{ \frac{0.2}{-3} + \frac{0.5}{-1} + \frac{1.0}{0} + \frac{0.5}{1} + \frac{0.1}{2} \right\}$$
  

$$B = posisitive \ medium = \left\{ \frac{0}{0} + \frac{0.7}{1} + \frac{1.0}{2} + \frac{0.5}{3} + \frac{0.2}{4} \right\}$$

- Perform the following operations on intervals. b)
  - 1) [3,2] + [3,4]
  - 2)  $[4, 2] \times [1, 2]$
- Differentiate between fuzzy sets and crisp sets. c)
- Write a short note on C means clustering. d)
- Find the Cartesian product represented by the relation  $R = X \times Y$ e)

$$X = \left\{ \frac{0.2}{10} + \frac{0.5}{20} + \frac{0.8}{40} + \frac{1.0}{60} + \frac{0.6}{80} + \frac{0.1}{100} \right\}$$
$$Y = \left\{ \frac{0.3}{0.5} + \frac{0.6}{1} + \frac{0.9}{1.5} + \frac{1.0}{4} + \frac{0.6}{8} + \frac{0.3}{20} \right\}$$

- **f**) Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables: Education of people
  - Fairly educated 1)
  - Educated 2)
  - Highly educated 3)
  - Not highly educated 4)
  - More or less educated 5)

Max. Marks: 80

# **SLR-FM-770**



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# Set S

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### Q.3 Answer the Following.

a) A fuzzy tolerance relation,  $\stackrel{R}{\sim}$ , is reflexive and symmetric. Find the equivalence

relation  $\stackrel{R_e}{\sim}$  and then classify it according to  $\lambda$ -cut levels = {0.7, 0.6, 0.5}.

 $R = \begin{bmatrix} 1 & 0.8 & 0 & 0.2 & 0.1 \\ 0.8 & 1 & 0.9 & 0 & 0.4 \\ 0 & 0.9 & 1 & 0 & 0.3 \\ 0.2 & 0 & 0 & 1 & 0.5 \\ 0.1 & 0.4 & 0.3 & 0.5 & 1 \end{bmatrix}$ 

**b)** In fuzzy automata, generate fuzzy input and output states under following conditions.

Output relation  $R = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0.5 & 1 & 0.7 \end{bmatrix}$  and state transition relation  $S = \begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}$ 

With initial state  $C^1 = \begin{bmatrix} 1 & 0.7 & 0.6 & 0.4 \end{bmatrix}$ Inputs  $A1 = \begin{bmatrix} 0.4 & 0 \end{bmatrix}$   $A2 = \begin{bmatrix} 1 & 0 \end{bmatrix}$   $A3 = \begin{bmatrix} 1 & 0.7 \end{bmatrix}$ **OR** 

b) What is defuzzification? Explain methods of defuzzification?

### Section – II

### Q.4 Answer the following.

a) A manufacturing company is planning to purchase a lathe and is assessing the proposals from four lathe manufacturers. The company has developed a reciprocal relation for the four manufacturers based on the speed of delivery of the lathes and the cost. The relation is

 $R = \begin{bmatrix} 0 & 0.1 & 0.7 & 0.2 \\ 0.9 & 0 & 0.6 & 1 \\ 0.3 & 0.4 & 0 & 0.5 \\ 0.8 & 0 & 0.5 & 0 \end{bmatrix}$ 

Calculate the degree of preference measures, and the distance to Type I, Type II consensus. Explain the differences between the distances to the three consensuses.



- a) Explain following
  - 1) Fuzzy linear programming
  - 2) Nontransitive ranking
- b) Explain FSPC for measurement and attribute SPC.

### Q.5 Attempt any four.

- a) Write a short note on Type 2 fuzzy.
- **b)** Explain application of fuzzy in Genetic.
- c) Explain fuzzy ranking method.
- d) Explain simple fuzzy control system.
- e) Explain Fuzzy Cognitive Map.