SLR-FM-227

Seat No.		Set	P

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
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 Marks: 14

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) $y = (c_1 + c_2x)\, e^x + (c_3 + c_4x)e^{-x}$
   b) $y = (c_1 + c_2x)\cos\sqrt{3}\,x + (c_3 + c_4x)\sin\sqrt{3}\;x$
   c) $y = (c_1 + c_2x)\, e^{-x} + (c_3 + c_4x)e^{x}$
   d) $y = (c_1 + c_2\cos x)e^x + (c_3 + c_4\sin x)e^x$

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) $\cos 3t + \sin 3t$

5) 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) $\int_0^\infty f_1(u)f_2(u)du$

6) 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) $y = 0.7x + 120$

7) 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

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's

c) Newton's Raphson d) Gauss Seidal

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 $x \geq 0$ 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) $\sqrt{\frac{2}{\pi}}\ \frac{1}{1+s^2}$

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) $1, k \geq 0$ b) $2^k, k \geq 0$

c) $2^k, k < 0$ d) not exists

Seat No.	

Set **P**

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt any three of the following question. **09**

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

x:	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.. **09**

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 $\frac{1}{s.(s^2+4)}$

Q.4 Attempt any two of the following question. **10**

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

x:	44	58	49	46	58	56	48	46	48	47
y:	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 $\frac{d^2Q}{dt^2} + \frac{Q}{LC} = \frac{E_0}{L}.\cos wt$

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. **09**

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

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

b) Solve the equation $xtan\, x + 1 = 0$ 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

$$f(k) = 3^k, \quad k < 0$$
$$= 2^k, \quad k \geq 0$$

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

Q.6 Attempt any three of the following questions. **09**

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 $k \geq 0$

d) Express the function $f(x) = 1 \quad 0 \leq x < \pi$

$$= 0 \quad x > \pi$$

as a Fourier sine integral representation

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

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

Q.7 Attempt any two of the following questions. **10**

a) Find the Fourier series of the function

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

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

$$\begin{aligned} f(x) &= 1 - x^2 \quad |x| \leq 1 \\ &= 0 \quad |x| > 1 \end{aligned}$$

Hence evaluate

$$\int_0^\infty \left(\frac{\sin x - x\cos x}{x^3}\right)\cos\left(\frac{x}{2}\right) dx$$

Seat No.	

Set **Q**

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Electronics & Telecommunication Engineering
ENGINEERING MATHEMATICS – III

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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 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

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14) If a random variable x has a Poisson distribution with mean 3, then $P(x = 4) =$ _____.

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Seat No.	

Set **Q**

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Electronics & Telecommunication Engineering
ENGINEERING MATHEMATICS – III

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Section – I

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Seat No.	

Set R

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Electronics & Telecommunication Engineering
ENGINEERING MATHEMATICS – III

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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1) 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) $\int_0^\infty f_1(u)f_2(t-u)du$

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Seat No.	

Set **R**

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Section-II

Q.5 Attempt any three of the following questions. **09**

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

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

b) Solve the equation $xtan\, x + 1 = 0$ 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

$$f(k) = 3^k, \quad k < 0$$
$$= 2^k, \quad k \geq 0$$

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

Q.6 Attempt any three of the following questions. **09**

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 $k \geq 0$

d) Express the function $f(x) = 1 \quad 0 \leq x < \pi$

$$= 0 \quad x > \pi$$

as a Fourier sine integral representation

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

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

Q.7 Attempt any two of the following questions. **10**

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

$$f(x) = 1 - x^2 \quad |x| \leq 1$$
$$= 0 \quad |x| > 1$$

Hence evaluate

$$\int_0^\infty \left(\frac{\sin x - x\cos x}{x^3}\right)\cos\left(\frac{x}{2}\right) dx$$

Seat No.		Set	S

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) 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

3) Fourier cosine transform of e^{-x} for $x \geq 0$ 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) $\sqrt{\frac{2}{\pi}}\ \frac{1}{1+s^2}$

4) 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) $-\frac{dF(z)}{dz}$

5) For $|z| > 1$, the inverse z-Transform of $\frac{z}{z-1}$ is _____.
   a) $1, k \geq 0$ b) $2^k, k \geq 0$
   c) $2^k, k < 0$ d) not exists

6) The general solution of $(D^4 + 6D^2 + 9)y = 0$ is _____.

a) $y = (c_1 + c_2x)\, e^x + (c_3 + c_4x)e^{-x}$

b) $y = (c_1 + c_2x)\cos\sqrt{3}\,x + (c_3 + c_4x)\sin\sqrt{3}\;x$

c) $y = (c_1 + c_2x)\, e^{-x} + (c_3 + c_4x)e^x$

d) $y = (c_1 + c_2\cos x)e^x + (c_3 + c_4\sin x)e^x$

7) 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) $-\frac{x}{4n^3}\sin nx$

8) 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) $\frac{1}{1-e^{-st}}\int_0^T e^{ST}f(t)dt$

9) $L^{-1}\left\{\frac{s+3}{s^2+3^2}\right\} =$ _____.

a) $\cos 3t$ b) $\sin 3t$

c) $3t + \cos 3t$ d) $\cos 3t + \sin 3t$

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) $\int_0^\infty f_1(u)f_2(u)du$

11) 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) $y = 0.7x + 120$

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

13) 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

14) 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

Seat No.	

Set **S**

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
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. **09**

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

x:	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.. **09**

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 $\frac{1}{s.(s^2+4)}$

Q.4 Attempt any two of the following question. **10**

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

x:	44	58	49	46	58	56	48	46	48	47
y:	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 $\frac{d^2Q}{dt^2} + \frac{Q}{LC} = \frac{E_0}{L}.\cos wt$

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. **09**

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

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

b) Solve the equation $xtan\, x + 1 = 0$ 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

$$f(k) = 3^k, \quad k < 0$$
$$= 2^k, \quad k \geq 0$$

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

Q.6 Attempt any three of the following questions. **09**

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 $k \geq 0$

d) Express the function $f(x) = 1 \quad 0 \leq x < \pi$

$$= 0 \quad x > \pi$$

as a Fourier sine integral representation

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

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

Q.7 Attempt any two of the following questions. **10**

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

$$f(x) = 1 - x^2 \quad |x| \leq 1$$
$$= 0 \quad |x| > 1$$

Hence evaluate

$$\int_0^\infty \left(\frac{\sin x - x\cos x}{x^3}\right)\cos\left(\frac{x}{2}\right) dx$$

Seat No.	

Set P

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 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) 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 Marks: 14

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

1) The ripple factor is independent of resistance in _____ filter.
   a) L b) LC
   c) C d) CLC

2) Load regulation of ideal power supply must be _____.
   a) Zero b) Infinite
   c) Large d) None of these

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

4) Load regulation can be improved in LC filter by _____.
   a) Inductor filter b) Using capacitor filter
   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 _____.
   a) Clamper circuit b) Half wave rectifier
   c) Both a & b d) Cant say

6) Reverse saturation current gets _____ for every _____ rise in temperature.
   a) Half, $10℃$ b) Triple, $30℃$
   c) Double, $10℃$ d) Constant, $10℃$

7) 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_L

8) Which are the majority charge carriers in P-channel JFET by enhancing the flow of current between two N-regions or gates?
   a) Holes b) Electrons
   c) Both a & b d) None of the above

9) Which internally connected region is heavily doped with an impurity by forming double PN junctions in JFET?
   a) Source
   b) Drain
   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_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) $I_E = I_{pE} + I_{nE}$

12) The correct relation between the transistor parameters α and β 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) CE amplifier
   c) CB amplifier
   d) Cascaded amplifier

Seat No.	

Set **P**

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 Max. Marks: 56
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

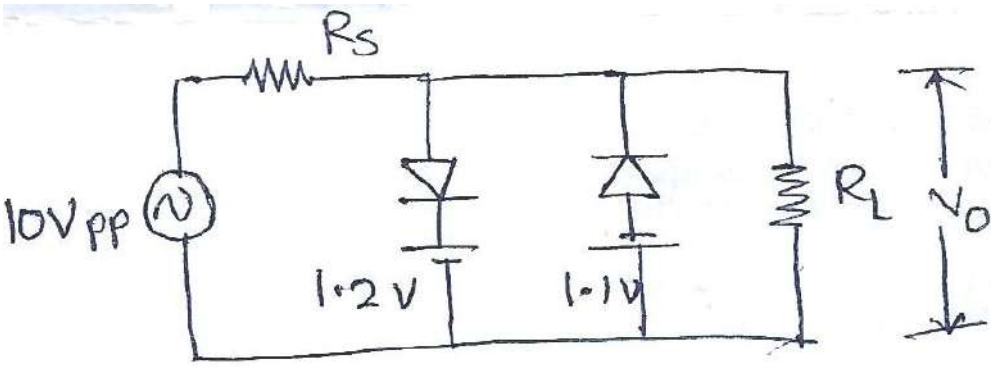
Q.2 Solve any four **16**

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.

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. **12**

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. **16**

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^{o} 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.

Q.5 Solve any Two questions. **12**

a) Consider transistor CE amplifier with $\mathrm{RL} = 2.7\mathrm{K}\Omega, \mathrm{hie} = 4.5\mathrm{K}\Omega, \mathrm{hre} = 2\ \mathrm{X}\ 10^{-4}, \mathrm{hfe} = -330, \mathrm{hoe} = 30\mu\mho$. 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 = 1.4KΩ.

c) Explain Common Source JFET amplifier with its basic parameters.

Seat No.	

Set **Q**

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 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) 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 Marks: 14

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

1) Which are the majority charge carriers in P-channel JFET by enhancing the flow of current between two N-regions or gates?
   a) Holes b) Electrons
   c) Both a & b d) None of the above

2) Which internally connected region is heavily doped with an impurity by forming double PN junctions in JFET?
   a) Source b) Drain
   c) Gate d) Channel

3) The output voltage of common base amplifier is _____ with input signal.
   a) in phase b) $270°$
   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 α and β are related by _____.
   a) $\beta = 1 - \alpha/\alpha$ b) $\beta = 1 + \alpha/\alpha$
   c) $\alpha = \beta + 1/\beta$ d) $\alpha = \beta/\beta + 1$

6) 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

7) Which of the following acts as a buffer?
   a) CC amplifier b) CE amplifier
   c) CB amplifier d) Cascaded amplifier

8) The ripple factor is independent of resistance in _____ filter.
   a) L b) LC
   c) C d) CLC

9) Load regulation of ideal power supply must be _____.
   a) Zero b) Infinite
   c) Large d) None of these

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

11) Load regulation can be improved in LC filter by _____.
   a) Inductor filter
   b) Using capacitor filter
   c) Using bleeder resistor
   d) Using bleeder capacitor

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, $10℃$
   b) Triple, $30℃$
   c) Double, $10℃$
   d) Constant, $10℃$

14) 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_L

Seat No.	

Set **Q**

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 Max. Marks: 56
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

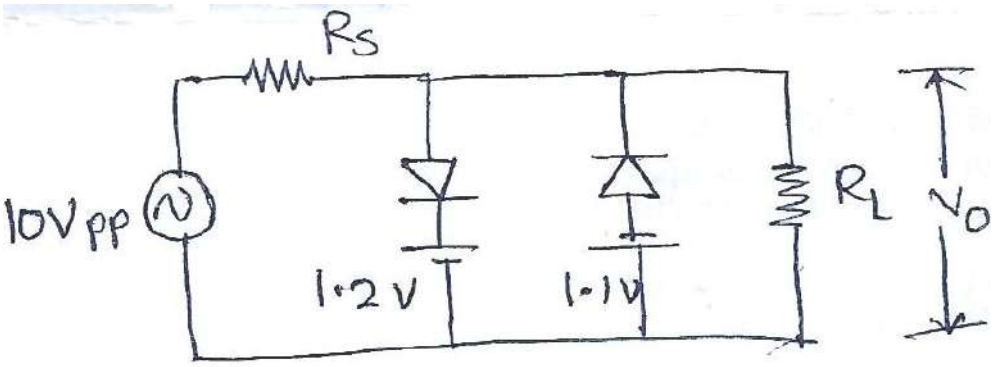
Q.2 Solve any four **16**

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.

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. **12**

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. **16**

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^{o} 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.

Q.5 Solve any Two questions. **12**

a) Consider transistor CE amplifier with $\mathrm{RL} = 2.7\mathrm{K}\Omega, \mathrm{hie} = 4.5\mathrm{K}\Omega, \mathrm{hre} = 2\ \mathrm{X}\ 10^{-4}, \mathrm{hfe} = -330, \mathrm{hoe} = 30\mu\mho$. 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 = 1.4KΩ.

c) Explain Common Source JFET amplifier with its basic parameters.

Seat No.	

Set R

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 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) 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 Marks: 14

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

1) 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

2) Reverse saturation current gets _____ for every _____ rise in temperature.
   a) Half, $10℃$ b) Triple, $30℃$
   c) Double, $10℃$ d) Constant, $10℃$

3) 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_L

4) Which are the majority charge carriers in P-channel JFET by enhancing the flow of current between two N-regions or gates?
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   b) LC
   c) C
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14) Load regulation can be improved in LC filter by _____.
   a) Inductor filter
   b) Using capacitor filter
   c) Using bleeder resistor
   d) Using bleeder capacitor

Seat No.	

Set **R**

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 Max. Marks: 56
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

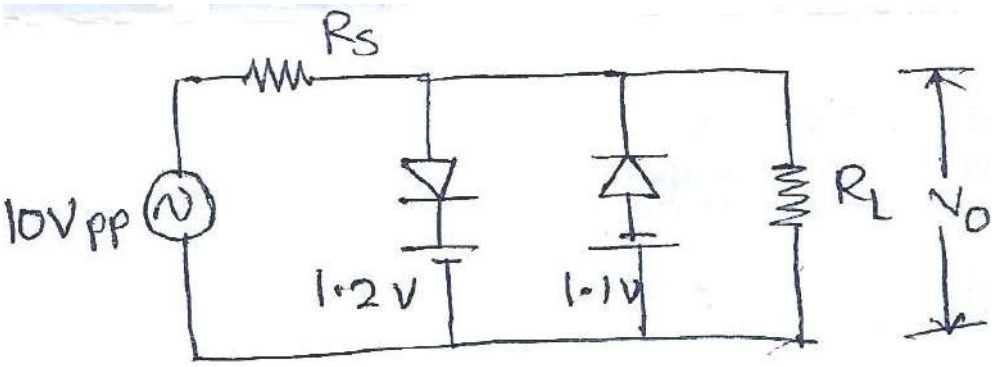
Q.2 Solve any four **16**

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.

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. **12**

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. **16**

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^{o} 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.

Q.5 Solve any Two questions. **12**

a) Consider transistor CE amplifier with $\mathrm{RL} = 2.7\mathrm{K}\Omega, \mathrm{hie} = 4.5\mathrm{K}\Omega, \mathrm{hre} = 2\ \mathrm{X}\ 10^{-4}, \mathrm{hfe} = -330, \mathrm{hoe} = 30\mu\mho$. 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 = 1.4KΩ.

c) Explain Common Source JFET amplifier with its basic parameters.

Seat No.		Set	S

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 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) Figures to the right indicate full marks.
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4) Use of electronic component datasheet is allowed.

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 output voltage of common base amplifier is _____ with input signal.
   a) in phase b) $270°$
   c) $90°$ out of phase d) $180°$

2) 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) $I_E = I_{pE} + I_{nE}$

3) The correct relation between the transistor parameters α and β are related by _____.
   a) $\beta = 1 - \alpha/\alpha$ b) $\beta = 1 + \alpha/\alpha$
   c) $\alpha = \beta + 1/\beta$ d) $\alpha = \beta/\beta + 1$

4) 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

5) Which of the following acts as a buffer?
   a) CC amplifier b) CE amplifier
   c) CB amplifier d) Cascaded amplifier

6) The ripple factor is independent of resistance in _____ filter.
   a) L b) LC
   c) C d) CLC

7) Load regulation of ideal power supply must be _____.
   a) Zero b) Infinite
   c) Large d) None of these

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

9) Load regulation can be improved in LC filter by _____.
   a) Inductor filter b) Using capacitor filter
   c) Using bleeder resistor d) Using bleeder capacitor

10) 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

11) Reverse saturation current gets _____ for every _____ rise in temperature.
   a) Half, $10℃$
   b) Triple, $30℃$
   c) Double, $10℃$
   d) Constant, $10℃$

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_L

13) Which are the majority charge carriers in P-channel JFET by enhancing the flow of current between two N-regions or gates?
   a) Holes
   b) Electrons
   c) Both a & b
   d) None of the above

14) Which internally connected region is heavily doped with an impurity by forming double PN junctions in JFET?
   a) Source
   b) Drain
   c) Gate
   d) Channel

Seat No.	

Set **S**

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 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Solve any four **16**

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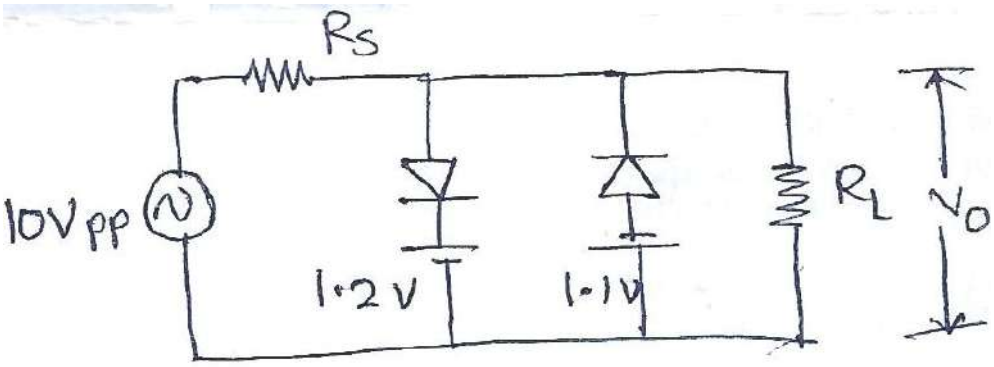

e) Derive expression for efficiency and ripple factor for half wave rectifier.

Q.3 Solve any two. **12**

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%.

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Seat No.	

Set **P**

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

Day & Date: Thursday, 12-12-2019 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.
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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) 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

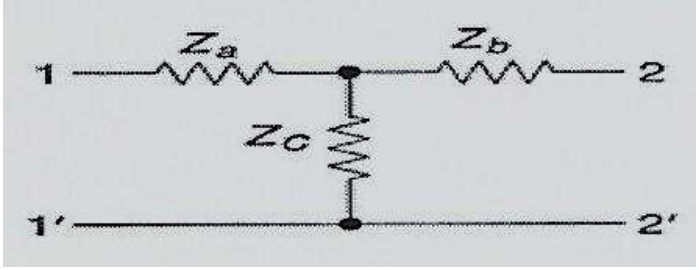
2) A practical current source consists of _____.
   a) An ideal current source in series with a resistance
   b) An ideal current source in parallel with a resistance
   c) An ideal current source in parallel with voltage source
   d) None of the above

3) 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

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) $V_L > V_C$ b) $V_C > V_L$
   c) $V_L = V_C$ 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 ($Z_a = 1\Omega$, $Z_b = 3\Omega$, & $Z_c = 2\Omega$)?



   a) 4 Ω b) 3 Ω
   c) 5 Ω d) 2 Ω

7) 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

8) If the number of zeros (n) are greater than the number of poles (m), then there will be _____ number of zeros at s = ∞.
   a) n
   b) M
   c) n-m
   d) n+m

9) 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) $10 \log 10\ (V2/V1)$

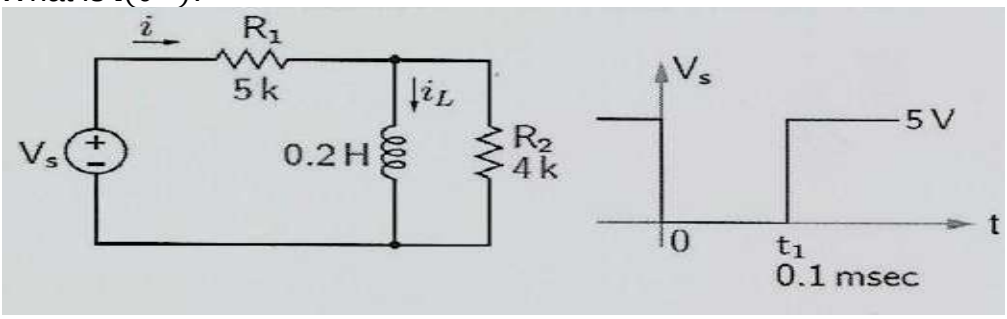
10) In band elimination filter, the frequency of resonance of individual arms is geometric _____.
   a) Mean of two cut-off frequencies
   b) Difference of two cut-off frequencies
   c) Product of two cut-off frequencies
   d) Division of two cut-off frequencies

11) 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

12) A series R-L circuit with R = 30Ω 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

13) The ratio of the current transform at one port to current transform at other port is called?
   a) Transfer admittance
   b) Transfer impedance
   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.
What is $i(0-)$?



   a) 0mA
   b) 1mA
   c) 0.56mA
   d) 0.75mA

Seat No.	

Set **P**

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

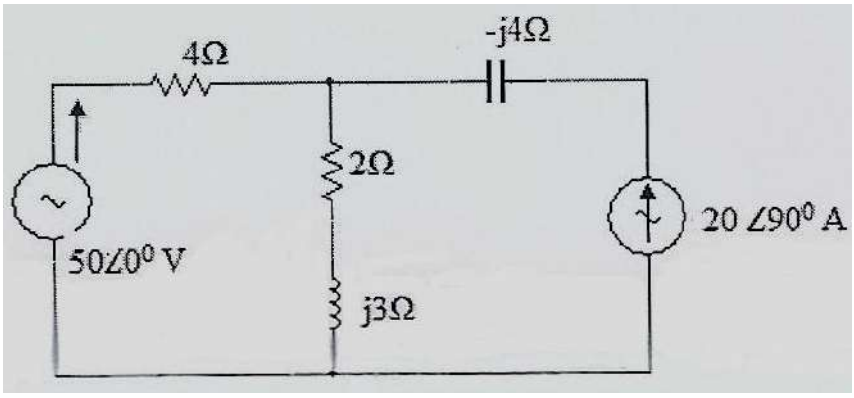
Day & Date: Thursday, 12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four. **16**

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

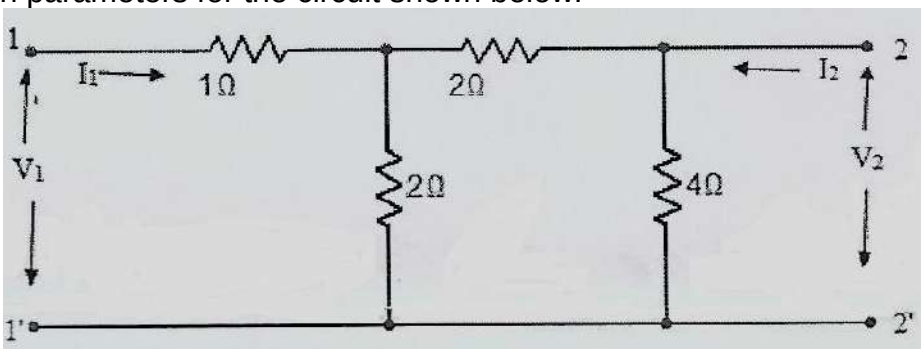


b) Derive expression for resonant frequency in series RLC circuit. How the value of R will affect on frequency response.

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} =10Ω , Z_{22} = 15 Ω, Z_{12} = Z_{21} = 5 Ω. Find the equivalent T n/w.

e) Find h parameters for the circuit shown below.

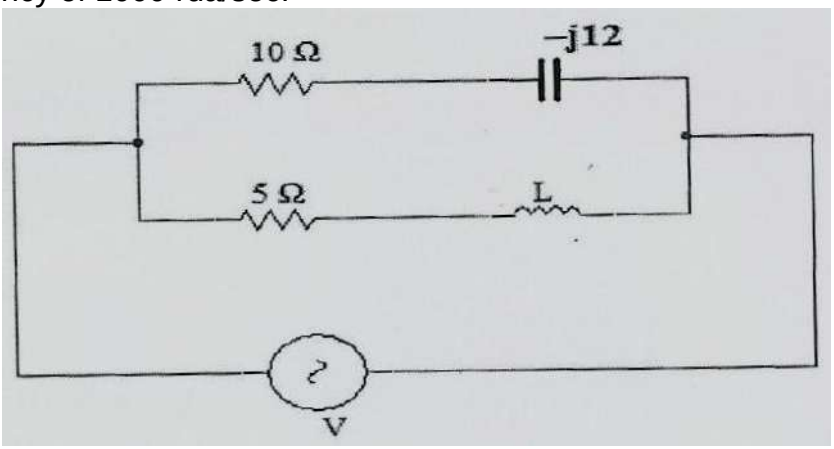


Q.3 Attempt any two. **12**

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 $\omega_r = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 - \left(\frac{L}{C}\right)}{R_C^2 - \left(\frac{L}{C}\right)}}$

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



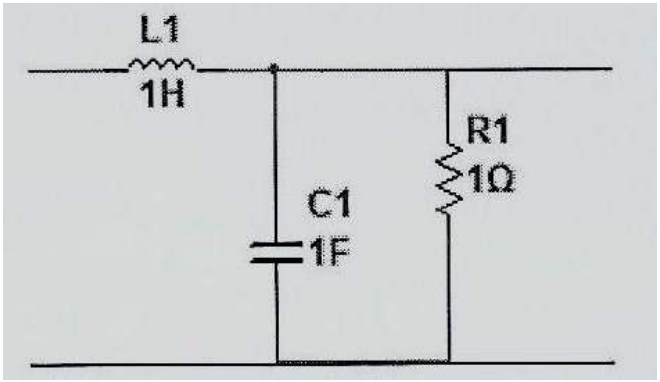
c) Explain reciprocity and symmetry for -
1) Z parameters
2) Y parameters

Section – II

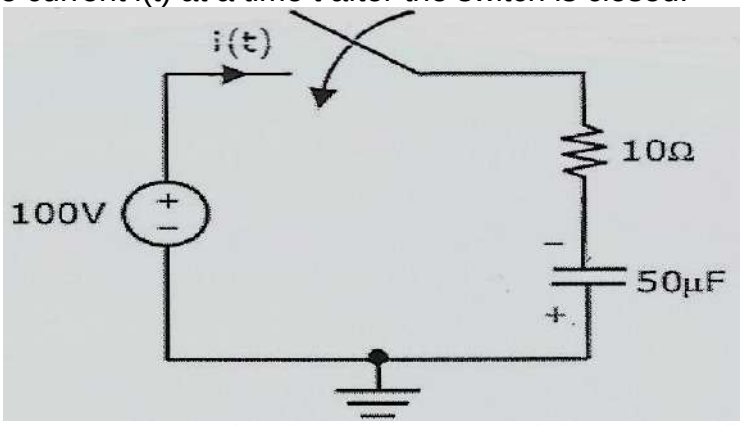
Q.4 Attempt any four **16**

a) Design a π type attenuator to give 20dB attenuation and to have characteristic impedance of 100Ω.

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.

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Q.5 Attempt any two. **12**

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).

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

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

Seat No.	

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 Max. Marks: 70
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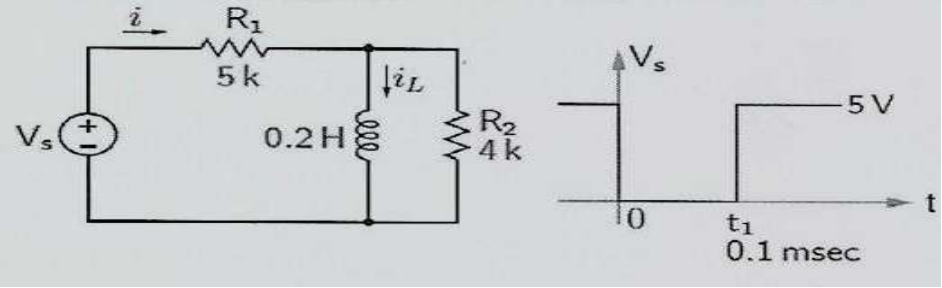

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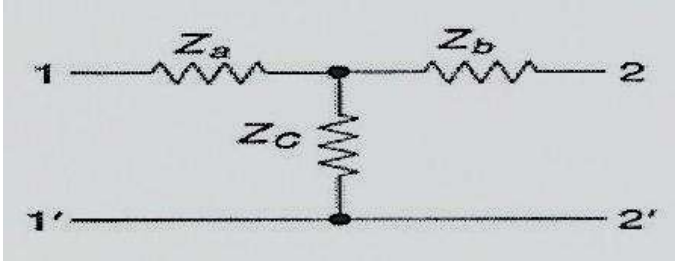

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Seat No.	

Set **Q**

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Electronics & Telecommunication Engineering
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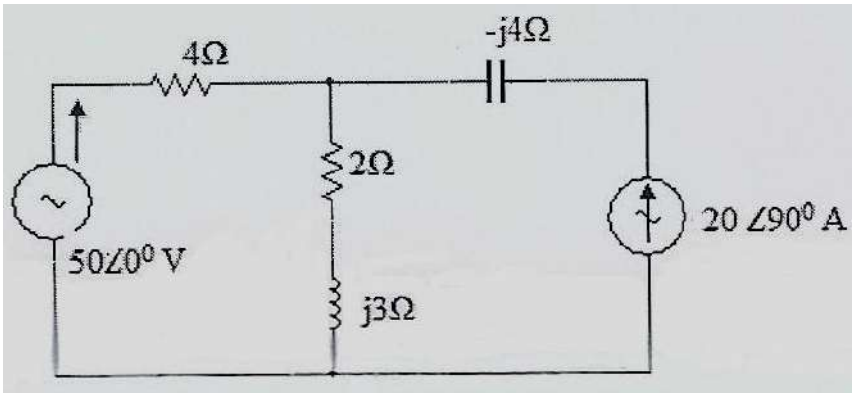

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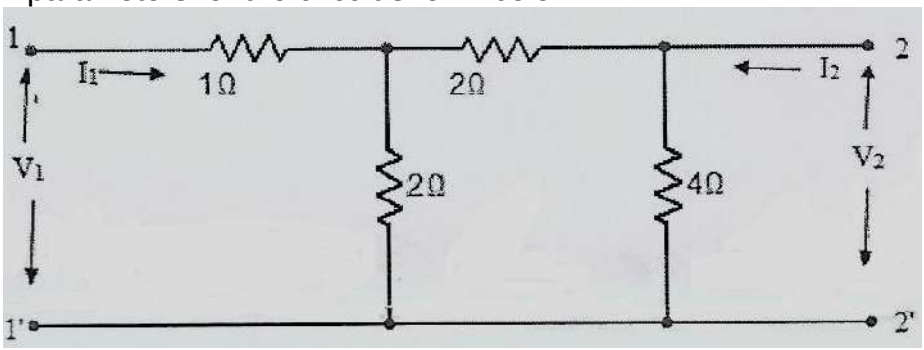

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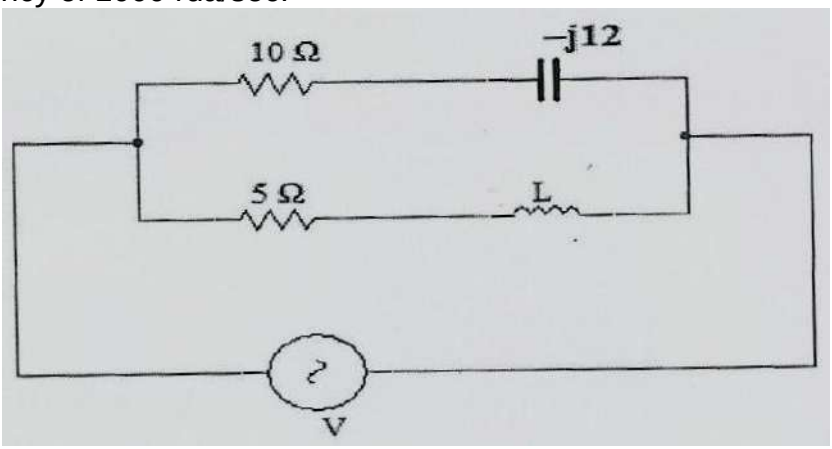

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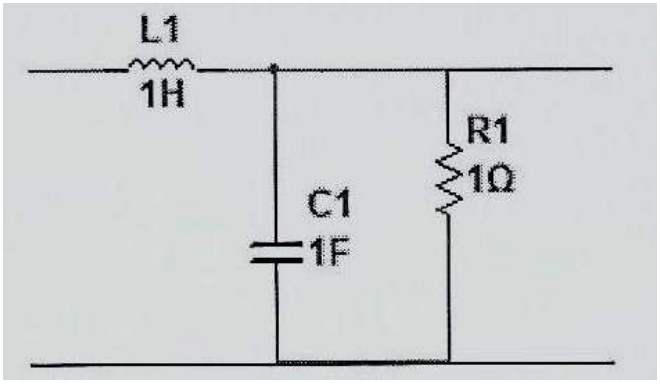

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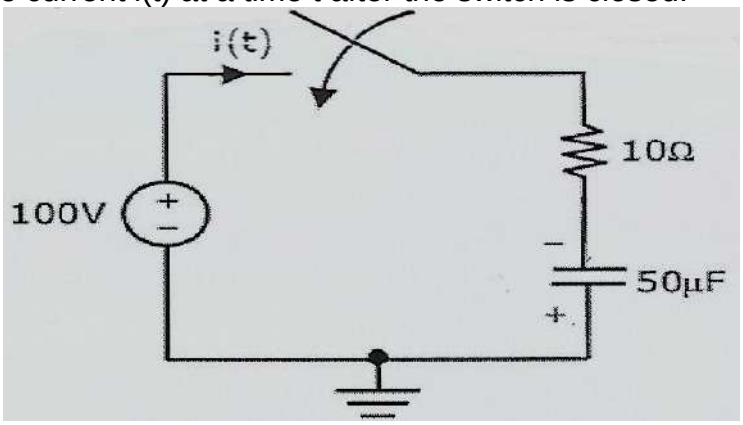

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a) Explain the classification of filter in brief. Design T section of m-derived LPF having cut off frequency of 1 Kz, Design impedance of 400Ω and the resonant frequency of 1100Hz.

b) Show the Pole zero Plot of the given network function V(S) and hence obtain V(t).

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

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

Seat No.	

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 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) Figures to the right indicate full marks.

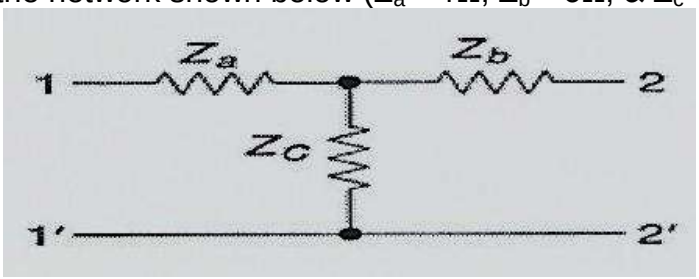
MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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) $V_L = V_C$ 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 = 1Ω, Z_b = 3Ω, & Z_c = 2Ω)?



   a) 4 Ω b) 3 Ω
   c) 5 Ω d) 2 Ω

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

4) If the number of zeros (n) are greater than the number of poles (m), then there will be _____ number of zeros at s = ∞.
   a) n b) M
   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) $10 \log 10\ (V2/V1)$

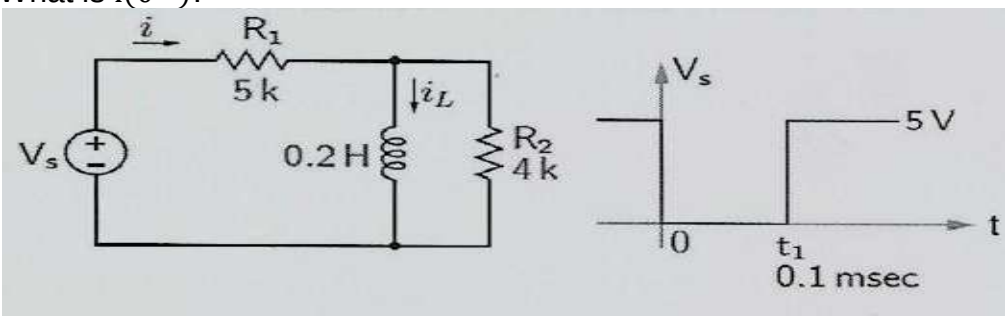
6) In band elimination filter, the frequency of resonance of individual arms is geometric _____.
   a) Mean of two cut-off frequencies
   b) Difference of two cut-off frequencies
   c) Product of two cut-off frequencies
   d) Division of two cut-off frequencies

7) 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 = 30Ω 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
   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 $i(0-)$?



   a) 0mA b) 1mA
   c) 0.56mA d) 0.75mA

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

13) 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

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 No.	

Set **R**

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

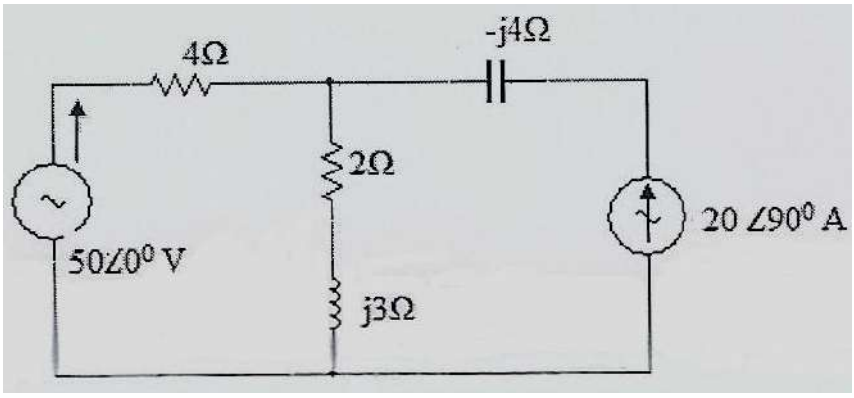
Day & Date: Thursday, 12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four. **16**

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

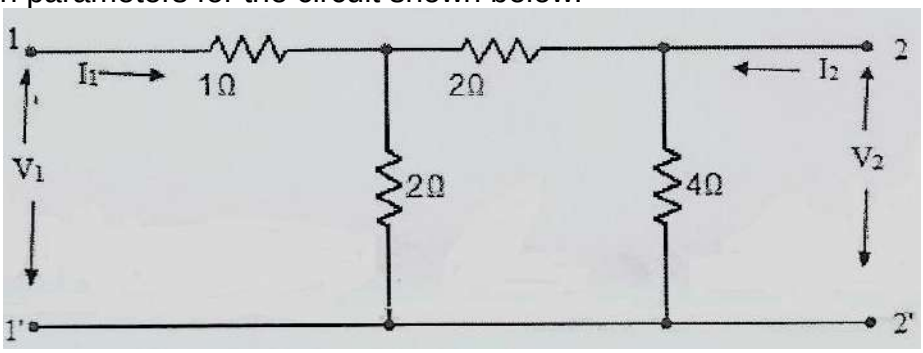


b) Derive expression for resonant frequency in series RLC circuit. How the value of R will affect on frequency response.

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} =10Ω , Z_{22} = 15 Ω, Z_{12} = Z_{21} = 5 Ω. Find the equivalent T n/w.

e) Find h parameters for the circuit shown below.

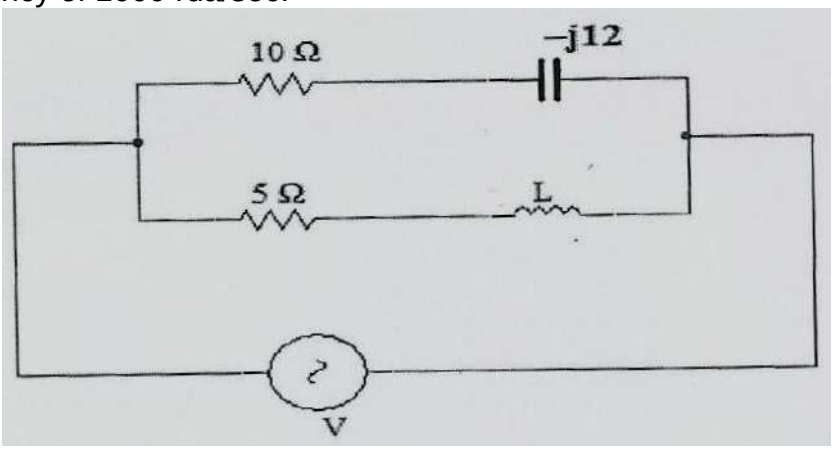


Q.3 Attempt any two. **12**

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 $\omega_r = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 - \left(\frac{L}{C}\right)}{R_C^2 - \left(\frac{L}{C}\right)}}$

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



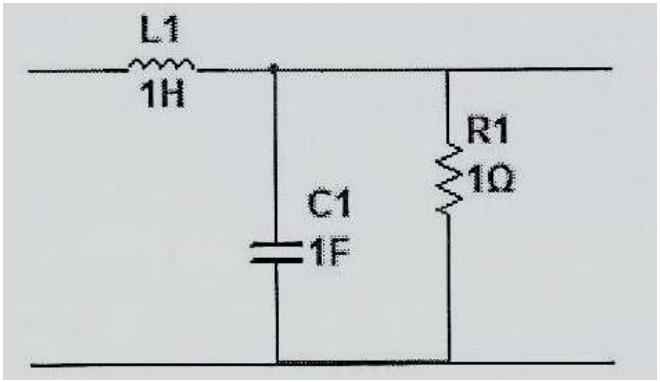
c) Explain reciprocity and symmetry for -
1) Z parameters
2) Y parameters

Section – II

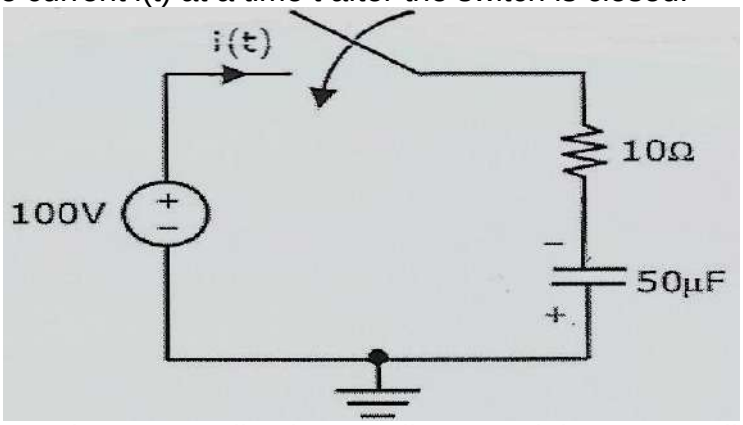
Q.4 Attempt any four **16**

a) Design a π type attenuator to give 20dB attenuation and to have characteristic impedance of 100Ω.

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. **12**

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).

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

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

Seat No.	

Set **S**

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

Day & Date: Thursday, 12-12-2019 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) 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) In band elimination filter, the frequency of resonance of individual arms is geometric _____.
   a) Mean of two cut-off frequencies
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   c) Product of two cut-off frequencies
   d) Division of two cut-off frequencies

2) 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
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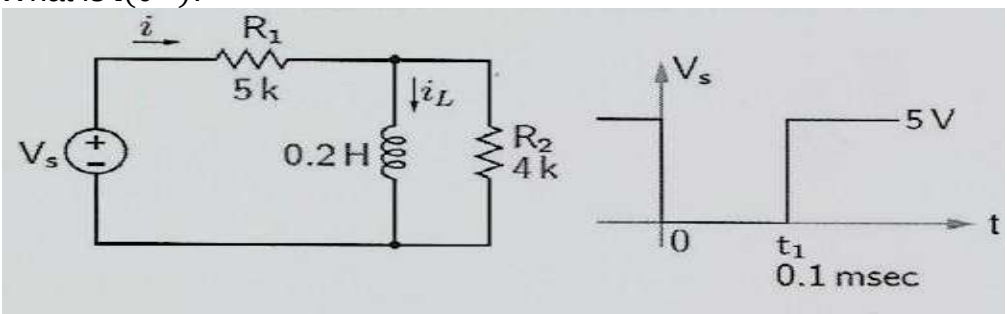
3) A series R-L circuit with R = 30Ω and L = 15H has a constant voltage V = 60V applied at t = 0. Determine the current (A) in the circuit at t = 0+.
   a) 1 b) 2
   c) 3 d) 0

4) The ratio of the current transform at one port to current transform at other port is called?
   a) Transfer admittance b) Transfer impedance
   c) Current transfer ratio d) Voltage transfer ratio

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 $i(0-)$?



   a) 0mA b) 1mA
   c) 0.56mA d) 0.75mA

6) 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

7) 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
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8) 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

9) In series RLC circuit operating frequency below for _____.
   a) I leads Vs
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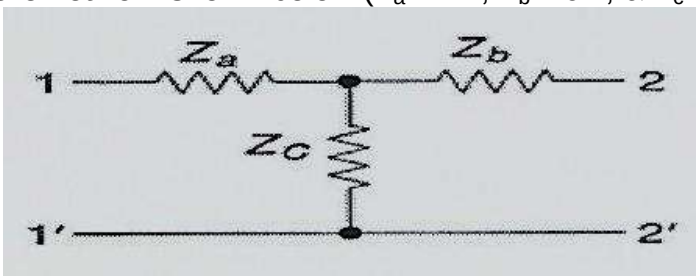
   d) None

10) 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) $V_L = V_C$
   d) $V_L + V_C$

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



   a) 4 Ω
   b) 3 Ω
   c) 5 Ω
   d) 2 Ω

12) 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

13) If the number of zeros (n) are greater than the number of poles (m), then there will be _____ number of zeros at s = ∞.
   a) n
   b) M
   c) n-m
   d) 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 No.	

Set **S**

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

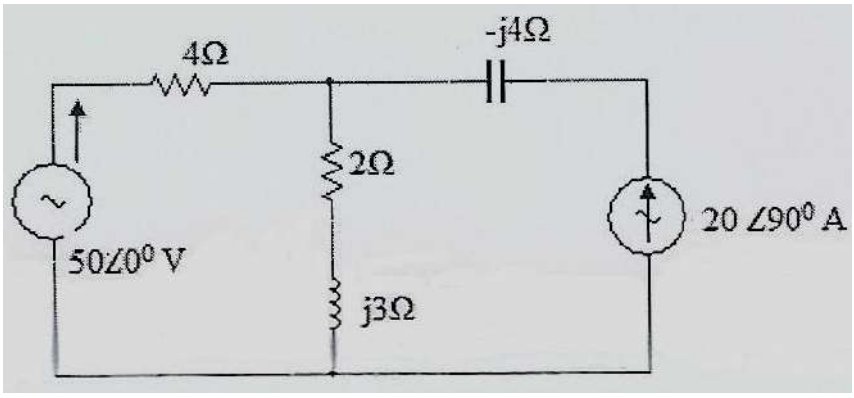
Day & Date: Thursday, 12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four. **16**

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

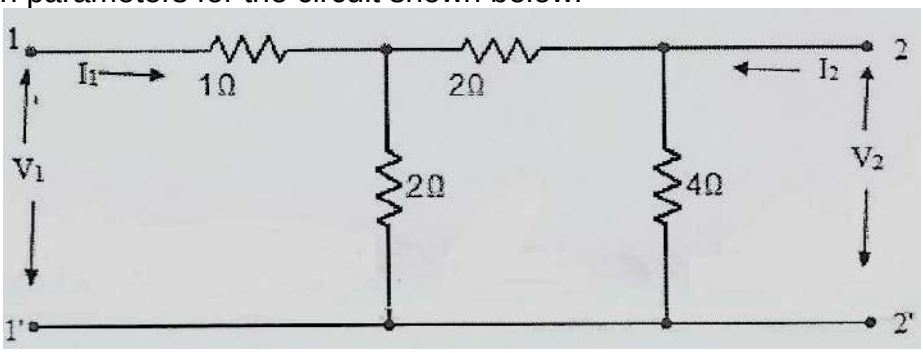


b) Derive expression for resonant frequency in series RLC circuit. How the value of R will affect on frequency response.

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} =10Ω , Z_{22} = 15 Ω, Z_{12} = Z_{21} = 5 Ω. Find the equivalent T n/w.

e) Find h parameters for the circuit shown below.

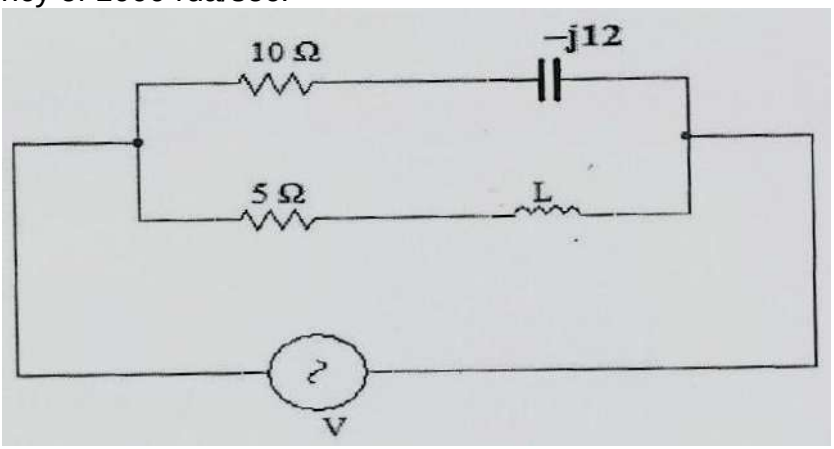


Q.3 Attempt any two. **12**

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 $\omega_r = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 - \left(\frac{L}{C}\right)}{R_C^2 - \left(\frac{L}{C}\right)}}$

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



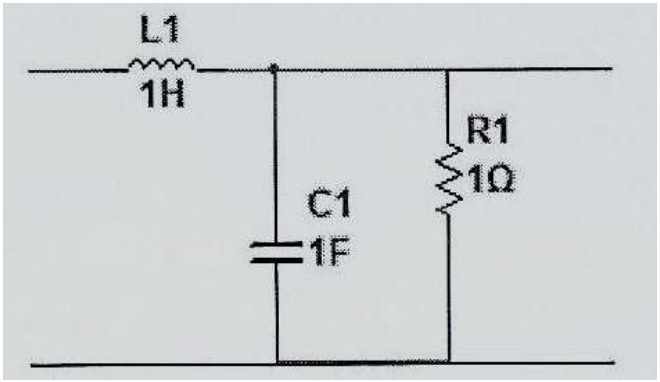
c) Explain reciprocity and symmetry for -
1) Z parameters
2) Y parameters

Section – II

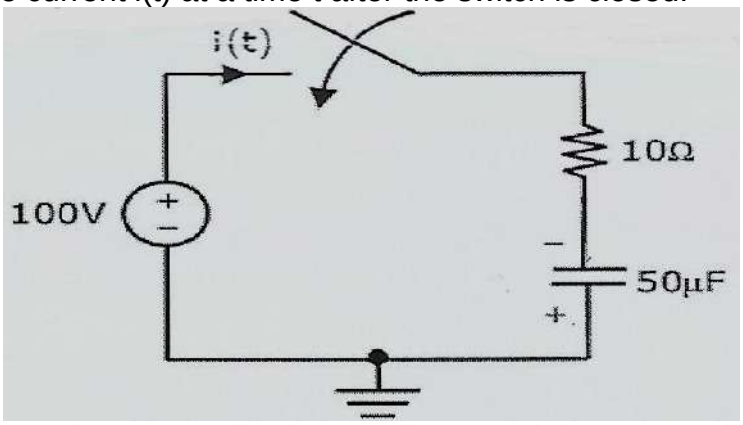
Q.4 Attempt any four **16**

a) Design a π type attenuator to give 20dB attenuation and to have characteristic impedance of 100Ω.

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. **12**

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).

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

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

Seat No.	

Set **P**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) 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

2) 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

3) 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

4) 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

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

6) How many NAND gates are used to construct Active High S-R flip flop?
   a) 5 b) 3
   c) 4 d) 8

7) In comparison with Serial adder the Parallel adder _____.
   a) is slower
   b) has same speed
   c) is faster
   d) has delayed output

8) Maximum MOD number for a 2-bit binary counter is _____.
   a) 4
   b) 3
   c) 8
   d) 16

9) 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

10) 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

11) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
   a) 32
   b) 16
   c) 5
   d) 4

12) 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

13) 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

14) How many flip-flops are in the IC7495?
   a) 1
   b) 2
   c) 3
   d) 4

Seat No.	

Set **P**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
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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) Maximum MOD number for a 2-bit binary counter is _____.
   a) 4 b) 3
   c) 8 d) 16

2) 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

3) 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

4) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
   a) 32 b) 16
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5) When two counters are cascaded, the overall MOD number is equal to the _____ of their individual MOD numbers.
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6) Clock signals are used in sequential logic circuits _____.
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7) How many flip-flops are in the IC7495?
   a) 1 b) 2
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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

14) In comparison with Serial adder the Parallel adder _____.
   a) is slower b) has same speed
   c) is faster d) has delayed output

Seat No.	

Set **Q**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **R**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) 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 slower b) has same speed
   c) 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

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

Seat No.	

Set **R**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **S**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) 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

2) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
   a) 32 b) 16
   c) 5 d) 4

3) 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

4) 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

5) How many flip-flops are in the IC7495?
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   c) 3 d) 4

6) 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

7) 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

8) 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

9) 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

10) 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

11) How many NAND gates are used to construct Active High S-R flip flop?
   a) 5 b) 3
   c) 4 d) 8

12) In comparison with Serial adder the Parallel adder _____.
   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

14) 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

Seat No.	

Set **S**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set P

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

Day & Date: Tuesday, 17-12-2019 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 minute in answer book.
2) All questions are compulsory.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q1 Choose the correct option alternatives from the options. 14

1) Modulation is done in_____.
   a) Transmitter
   b) Radio receiver
   c) Between transmitter and radio receiver
   d) None of the above

2) 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

3) 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

4) In an AM wave, the majority of the power is in _____.
   a) Lower Sideband b) Upper sideband
   c) Carrier d) None of above

5) Low frequency noise is _____.
   a) Shot Nosie b) Thermal Nosie
   c) Flicker Nosie d) None of above

6) Nosie figure of an amplifier is always _____.
   a) Less than one b) Greater than one
   c) Equal to one d) Equal to 100

7) An AM broadcast transmitter has a carrier power of 50KW. with 80% modulation, total power that would be produced will be ____.
   a) 40 KW b) 50 KW
   c) 66 KW d) 100 KW

8) The amount of frequency deviation in FM signal depends on _____.
   a) Amplitude of the modulating signal
   b) Carrier frequency
   c) Modulating frequency
   d) Transmitter amplifier

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) Ionosphere
   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
   b) Uni-directional
   c) Pattern of Eight
   d) 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

SLR-FM-231

Seat No.	

Set P

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

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

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

Day & Date: Tuesday, 17-12-2019 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 minute in answer book.
2) All questions are compulsory.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q1 Choose the correct option alternatives from the options. 14

1) The amount of frequency deviation in FM signal depends on _____.
   a) Amplitude of the modulating signal
   b) Carrier frequency
   c) Modulating frequency
   d) Transmitter amplifier

2) 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

3) Which mode of propagation is adopted in HF antennas?
   a) Ionosphere b) Ground wave
   c) Tropospheric d) All of the above

4) The Nquist sample rate for a maximum analog information frequency of 4 Khz is _____.
   a) 2KHz b) 4KHz
   c) 8KHz d) 16KHz

5) Radiation pattern of half wave dipole antenna is _____.
   a) Omni-directional b) Uni-directional
   c) Pattern of Eight d) None

6) What is the maximum modulating frequency allowed in FM broadcastings?
   a) 40 KHz b) 75 KHz
   c) 15 KHz d) 120 KHz

7) Indirect Method of FM generation is _____.
   a) Reactance modulator b) Varactor diode modulator
   c) Transistorized modulator d) Armstrong modulator

8) Modulation is done in_____.
   a) Transmitter
   b) Radio receiver
   c) Between transmitter and radio receiver
   d) None of the above

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
   b) Upper sideband
   c) Carrier
   d) None of above

12) Low frequency noise is _____.
   a) Shot Nosie
   b) Thermal Nosie
   c) Flicker 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
   b) 50 KW
   c) 66 KW
   d) 100 KW

Seat No.	

Set **Q**

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

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set R

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

Day & Date: Tuesday, 17-12-2019 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 minute in answer book.
2) All questions are compulsory.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q1 Choose the correct option alternatives from the options. 14

1) Low frequency noise is _____.
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6) Which mode of propagation is adopted in HF antennas?
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7) The Nquist sample rate for a maximum analog information frequency of 4 Khz is _____.
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   c) 8KHz d) 16KHz

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9) What is the maximum modulating frequency allowed in FM broadcastings?
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13) The IF is 455 kHz. If the radio receiver is tuned to 855 kHz, the local oscillator frequency is _____.
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14) In an AM wave, the majority of the power is in _____.
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   b) Upper sideband
   c) Carrier
   d) None of above

Seat No.	

Set **R**

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

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **16**

a) Explain the characteristics of AM receiver.
b) Draw the schematic diagram of VSB modulator and explain.
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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.

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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.
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Section – II

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d) Explain pulse amplitude modulation method.
e) What is ground wave propagation? What are its limitation?

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a) With block diagram, explain the working of the Armstrong method of FM generation.
b) Write a short note on.
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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.

Seat No.		Set	S

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

Day & Date: Tuesday, 17-12-2019 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 minute in answer book.
2) All questions are compulsory.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q1 Choose the correct option alternatives from the options. 14

1) Which mode of propagation is adopted in HF antennas?
   a) Ionosphere b) Ground wave
   c) Tropospheric d) All of the above

2) The Nquist sample rate for a maximum analog information frequency of 4 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

4) What is the maximum modulating frequency allowed in FM broadcastings?
   a) 40 KHz b) 75 KHz
   c) 15 KHz d) 120 KHz

5) Indirect Method of FM generation is _____.
   a) Reactance modulator b) Varactor diode modulator
   c) Transistorized modulator d) Armstrong modulator

6) Modulation is done in_____.
   a) Transmitter
   b) Radio receiver
   c) Between transmitter and radio receiver
   d) None of the above

7) 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

8) 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

9) In an AM wave, the majority of the power is in _____.
   a) Lower Sideband b) Upper sideband
   c) Carrier d) None of above

10) Low frequency noise is _____.
   a) Shot Nosie
   b) Thermal Nosie
   c) Flicker Nosie
   d) None of above

11) Nosie figure of an amplifier is always _____.
   a) Less than one
   b) Greater than one
   c) Equal to one
   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 ____.
   a) 40 KW
   b) 50 KW
   c) 66 KW
   d) 100 KW

13) The amount of frequency deviation in FM signal depends on _____.
   a) Amplitude of the modulating signal
   b) Carrier frequency
   c) Modulating frequency
   d) Transmitter amplifier

14) 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

Seat No.	

Set **S**

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

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **P**

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 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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 Marks: 14

Q.1 Choose the correct Answer **14**

1) Output resistance of current series negative feedback amplifier _____.
   a) Increases b) Decreases
   c) Does not change d) Becomes Unpredictable

2) When multistage amplifier is used to amplify DC signal then the coupling used is _____.
   a) Direct b) Transformer
   c) R-C d) R-L

3) If the transistor is operated in such a way that output current flows for 60^o 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
   c) 30.92 ohm d) None of the these

5) When no signal is applied the approximate collector efficiency of Class A 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
   c) Excellent d) Poor

7) Cascading two amplifier stages will result in _____.
   a) reduction in gain and increase in bandwidth
   b) reduction in gain and reduction in bandwidth
   c) increase in gain and reduction in bandwidth
   d) increase in gain and increase in bandwidth

8) 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

9) Schmitt trigger is _____.
   a) Oscillator b) Amplifier
   c) Comparator d) All of these

10) Sine wave can be converted by _____.
   a) Rectifier b) Schmitt trigger
   c) Astable multivibrator d) All of these

11) In monostable multivibrator quasi stable state duration is _____.
   a) RC b) 0.7 RC
   c) 1.4 RC d) None of these

12) 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

13) For IC regulators output capacitor is required for _____.
   a) Improving stability b) Short circuit protection
   c) Improve transient response d) 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

Seat No.	

Set **P**

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 Max. Marks: 56
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 **16**

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 **12**

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 **16**

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.

d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of 10Ω to 30Ω.

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} = 12KΩ, V_{BE1} = 0.6V
For Q2, h_{fe2}= 150, h_{ie2} = 3KΩ, 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, 40Ω.

Seat No.	

Set **Q**

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 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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 Marks: 14

Q.1 Choose the correct Answer **14**

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

9) When multistage amplifier is used to amplify DC signal then the coupling used is _____.
   a) Direct b) Transformer
   c) R-C d) R-L

10) If the transistor is operated in such a way that output current flows for 60^{o} of the input signal then its _____operation.
   a) Class A b) Class B
   c) Class C d) Class D

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.
   a) 16.92 ohm b) 20.92 ohm
   c) 30.92 ohm d) None of the these

12) When no signal is applied the approximate collector efficiency of Class A power amplifier is _____.
   a) 10% b) 0%
   c) 25% d) 50%

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 _____.
   a) reduction in gain and increase in bandwidth
   b) reduction in gain and reduction in bandwidth
   c) increase in gain and reduction in bandwidth
   d) increase in gain and increase in bandwidth

Seat No.	

Set **Q**

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 Max. Marks: 56
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 **16**

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 **12**

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 **16**

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.

d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of 10Ω to 30Ω.

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} = 12KΩ, V_{BE1} = 0.6V
For Q2, h_{fe2}= 150, h_{ie2} = 3KΩ, 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, 40Ω.

Seat No.	

Set **R**

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 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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 Marks: 14

Q.1 Choose the correct Answer **14**

1) When no signal is applied the approximate collector efficiency of Class A power amplifier is _____.
   a) 10% b) 0%
   c) 25% d) 50%

2) The frequency response of transformer coupled amplifier is _____.
   a) Good b) Very Good
   c) Excellent d) Poor

3) Cascading two amplifier stages will result in _____.
   a) reduction in gain and increase in bandwidth
   b) reduction in gain and reduction in bandwidth
   c) increase in gain and reduction in bandwidth
   d) increase in gain and increase in bandwidth

4) 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

5) Schmitt trigger is _____.
   a) Oscillator b) Amplifier
   c) Comparator d) All of these

6) Sine wave can be converted by _____.
   a) Rectifier b) Schmitt trigger
   c) Astable multivibrator d) 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 used should have _____.
   a) less td b) moretf
   c) less td and tr d) less td, tr, tf, ts

9) For IC regulators output capacitor is required for _____.
   a) Improving stability b) Short circuit protection
   c) Improve transient response d) Over voltage protection

10) In IC 555 discharge pin is _____.
   a) Pin No 2 b) Pin No 7
   c) Pin No 4 d) Pin No 6

11) Output resistance of current series negative feedback amplifier _____.
   a) Increases b) Decreases
   c) Does not change d) Becomes Unpredictable

12) When multistage amplifier is used to amplify DC signal then the coupling used is _____.
   a) Direct b) Transformer
   c) R-C d) R-L

13) If the transistor is operated in such a way that output current flows for 60^{o} 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.
   a) 16.92 ohm b) 20.92 ohm
   c) 30.92 ohm d) None of the these

Seat No.	

Set **R**

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 Max. Marks: 56
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 **16**

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 **12**

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 **16**

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.

d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of 10Ω to 30Ω.

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} = 12KΩ, V_{BE1} = 0.6V
For Q2, h_{fe2}= 150, h_{ie2} = 3KΩ, 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, 40Ω.

Seat No.	

Set **S**

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 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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 Marks: 14

Q.1 Choose the correct Answer **14**

1) Sine wave can be converted by _____.
   a) Rectifier b) Schmitt trigger
   c) Astable multivibrator d) All of these

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 td b) moretf
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4) For IC regulators output capacitor is required for _____.
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   c) Pin No 4 d) Pin No 6

6) Output resistance of current series negative feedback amplifier _____.
   a) Increases b) Decreases
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7) When multistage amplifier is used to amplify DC signal then the coupling used is _____.
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9) 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
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   c) 30.92 ohm
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10) When no signal is applied the approximate collector efficiency of Class A power amplifier is _____.
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   b) 0%
   c) 25%
   d) 50%

11) The frequency response of transformer coupled amplifier is _____.
   a) Good
   b) Very Good
   c) Excellent
   d) Poor

12) Cascading two amplifier stages will result in _____.
   a) reduction in gain and increase in bandwidth
   b) reduction in gain and reduction in bandwidth
   c) increase in gain and reduction in bandwidth
   d) increase in gain and increase in bandwidth

13) 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

14) Schmitt trigger is _____.
   a) Oscillator
   b) Amplifier
   c) Comparator
   d) All of these

Seat No.		Set	S

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 Max. Marks: 56
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 **16**

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

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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 **12**

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 **16**

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.

d) Design a constant current source using IC 7805 to source a current variation from 100mA to 200mA to the load variation of 10Ω to 30Ω.

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} = 12KΩ, V_{BE1} = 0.6V
For Q2, h_{fe2}= 150, h_{ie2} = 3KΩ, 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, 40Ω.

SLR-FM-233

Seat No.	

Set P

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

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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

2) 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

3) Pverflow condition of stack is _____.
   a) front=rear=max-1 b) front=rear=0
   c) top=max-1 d) none of the above

4) The postfix form of A*B+C/D is?
   a) *AB/CD+ b) AB*CD/+
   c) A*BC+/D d) ABCD+/*

5) Which data structure is used for implementing recursion?
   a) Queue b) Stack
   c) Array d) List

6) Factorial (0) is _____.
   a) 0 b) 1
   c) infinity d) Undefined

7) Linked lists are not suitable for _____.
   a) Insertion sort b) Binary search
   c) Radix Sort d) Polynominal manipulation

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
   c) Linked List d) none of the mentioned

10) What is the worst case for linear search?
   a) O(nlogn) b) O(logn)
   c) O(n) d) O(1)

11) The complexity of Binary search algorithm is _____.
   a) O (n2) b) O (log)
   c) O (n) d) O (n log n)

12) _____ 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

13) Partition and exchange sort is _____.
   a) quick sort b) tree sort
   c) heap sort d) bubble sort

14) Merge sort uses _____.
   a) Greedy approach b) Backtracking
   c) Heuristic approach d) Divide-and-conquer

Seat No.	

Set **P**

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

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

Section – I

Q.2 Attempt any four of the following questions. **16**

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
$A - B/(C\ ^*\mathrm{D} \wedge \mathrm{E})$

Q.3 Attempt any two of the following questions. **12**

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.

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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. **12**

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.

Seat No.	

Set **Q**

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

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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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) Binary trees can have how many children?
   a) 2 b) any number of children
   c) 0 or 1 or 2 d) 0 or 1

2) The Data structure used in standard implementation of Breadth First Search is _____.
   a) Stack b) Queue
   c) Linked List d) none of the mentioned

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   a) front=rear=max-1 b) front=rear=0
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   a) *AB/CD+ b) AB*CD/+
   c) A*BC+/D d) ABCD+/*

12) Which data structure is used for implementing recursion?
   a) Queue b) Stack
   c) Array d) List

13) Factorial (0) is _____.
   a) 0 b) 1
   c) infinity d) Undefined

14) Linked lists are not suitable for _____.
   a) Insertion sort b) Binary search
   c) Radix Sort d) Polynominal manipulation

Seat No.	

Set **Q**

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

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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 of the following questions. **16**

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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
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$A - B/(C\ ^{*}\mathrm{D} \wedge \mathrm{E})$

Q.3 Attempt any two of the following questions. **12**

a) Write a C program to implement following operation on singly link list.
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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.

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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. **12**

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.

Seat No.	

Set **R**

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

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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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) Which data structure is used for implementing recursion?
   a) Queue b) Stack
   c) Array d) List

2) Factorial (0) is _____.
   a) 0 b) 1
   c) infinity d) Undefined

3) Linked lists are not suitable for _____.
   a) Insertion sort b) Binary search
   c) Radix Sort d) Polynominal manipulation

4) Binary trees can have how many children?
   a) 2 b) any number of children
   c) 0 or 1 or 2 d) 0 or 1

5) The Data structure used in standard implementation of Breadth First Search is _____.
   a) Stack b) Queue
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14) The postfix form of A*B+C／D is?
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   b) AB*CD/+
   c) A*BC+/D
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Seat No.	

Set **R**

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

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 the right indicate full marks.
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Section – I

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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
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$A - B/(C\ ^*\mathrm{D} \wedge \mathrm{E})$

Q.3 Attempt any two of the following questions. **12**

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d) Explain Binary search algorithm with example.
e) Differentiate between DFS and BFS.

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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.

Seat No.	

Set **S**

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

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the worst case for linear search?
   a) O(nlogn) b) O(logn)
   c) O(n) d) O(1)

2) The complexity of Binary search algorithm is _____.
   a) O (n2) b) O (log)
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   a) *AB/CD+ b) AB*CD/+
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10) Which data structure is used for implementing recursion?
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11) Factorial (0) is _____.
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   a) Insertion sort
   b) Binary search
   c) Radix Sort
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13) Binary trees can have how many children?
   a) 2
   b) any number of children
   c) 0 or 1 or 2
   d) 0 or 1

14) The Data structure used in standard implementation of Breadth First Search is _____.
   a) Stack
   b) Queue
   c) Linked List
   d) none of the mentioned

Seat No.	

Set **S**

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

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 the right indicate full marks.
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Section – I

Q.2 Attempt any four of the following questions. **16**

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
$A - B/(C\ ^*\mathrm{D} \wedge \mathrm{E})$

Q.3 Attempt any two of the following questions. **12**

a) Write a C program to implement following operation on singly link list.
i) Creation of list
ii) Insertion of element at end
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iv) Display
b) Write an algorithm for Enqueue and Dequeue operation performed on Circular Queue.
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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. **12**

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.

SLR-FM-234

Seat No.	

Set P

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

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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 Marks: 14

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

2) The current in electrical circuit is analogous to _____in mechanical translational system.
   a) Mass (M) b) displacement (x)
   c) velocity d) force (F)

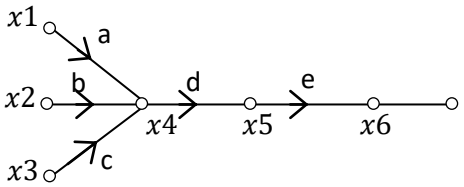
3) A control system in which control action is dependent on output is known as_____.
   a) Open loop system b) semiclosed system
   c) closed system d) indeterminist

4) The characteristics equation (S +1)(S +2)(S - 3) represents a _____.
   a) Stable system b) unstable system
   c) marginally stable d) indeterminist

5) The transfer function $P(S) = \frac{(2S+1)}{(S^2+S+1)}$ represents.
   a) Stable system b) unstable system
   c) marginally stable d) indeterminist

6) Which of following element is not used in automatic control system?
   a) Sensor b) error detector
   c) Oscillator d) final control element

7) From the signal flow graph shown in figure below, x6=



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

8) Which of the following compensator will be used to increase the bandwidth of a control system?
   a) phase lag
   b) phase lag lead
   c) phase lead
   d) none of above

9) For making an unstable system stable _____.
   a) gain of system should be increased
   b) gain of system should be decreased
   c) the number of zeros to the open loop transfer function should be increased
   d) the number of poles to the open loop transfer function should be increased

10) What will be nature of system, if the poles of system are lying on the imaginary axis in S-plane?
   a) marginally stable
   b) conditionally stable
   c) stable
   d) Zero

11) Damping is proportional to _____.
   a) gain
   b) $\frac{1}{\text{gain}}$
   c) $\sqrt{\text{gain}}$
   d) $\frac{1}{\sqrt{\text{gain}}}$

12) The type 1 system has _____at the origin.
   a) no pole
   b) no zero
   c) simple pole
   d) two poles

13) Lag compensator reduces _____.
   a) bandwidth
   b) rise time
   c) transient response
   d) all of these

14) If both gain and phase margin are positive then the system is _____.
   a) stable
   b) unstable
   c) indeterminist
   d) marginally stable

Seat No.	

Set **P**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

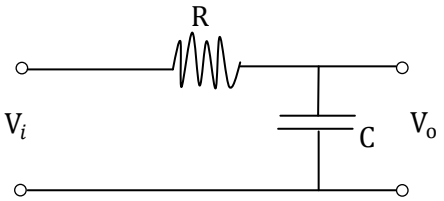
Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four questions. **16**

a) Define control system. Explain types of control system

b) Find transfer function of following system.

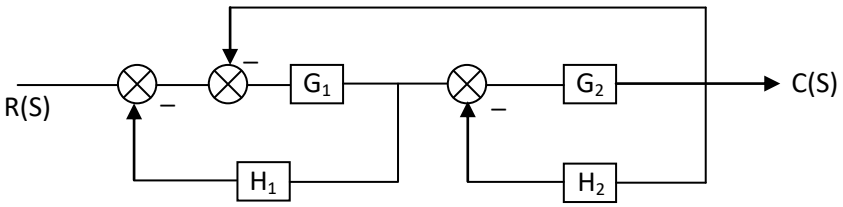


c) Check stability of $2S^4 + 2S^3 + S^2 + 3S + 2 = 0$

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

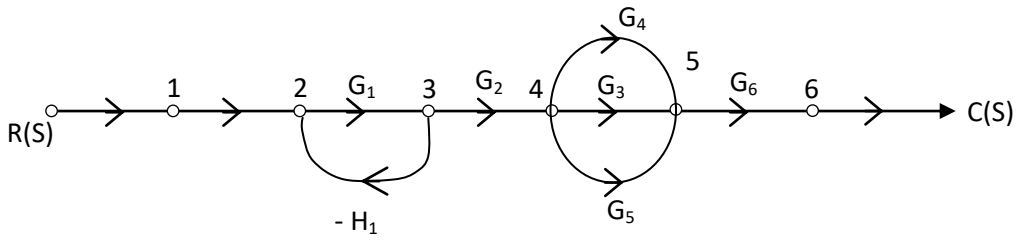
Q.3 a) Find transfer function of system given in figure. **06**



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

OR

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



Section – II

Q.4 Attempt any four questions. **16**

a) Determine different error constants for a system having

$G(S) = \frac{K}{S(S^2+2S+5)}$ $H(S) = \frac{10}{S+4}$

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)

e) Explain rules for construction of root locus.

Q.5 Attempt any two **12**

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

$G(S) = \frac{K}{S(S+4)(S+5)}$

Sketch root locus as K varies from zero to infinity.

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

1) natural frequency of oscillation
2) damping factor
3) damping frequency
4) peak time tp
5) delay time td
6) peak overshoot Mp

c) Sketch Bode plot for transfer function

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

Determine

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

Seat No.	

Set **Q**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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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

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   a) phase lag b) phase lag lead
   c) phase lead d) none of above

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   d) the number of poles to the open loop transfer function should be 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 b) conditionally stable
   c) stable d) Zero

4) Damping is proportional to _____.
   a) gain b) $\frac{1}{\text{gain}}$
   c) $\sqrt{\text{gain}}$ d) $\frac{1}{\sqrt{\text{gain}}}$

5) The type 1 system has _____at the origin.
   a) no pole b) no zero
   c) simple pole d) two poles

6) Lag compensator reduces _____.
   a) bandwidth b) rise time
   c) transient response d) all of these

7) If both gain and phase margin are positive then the system is _____.
   a) stable b) unstable
   c) indeterminist d) marginally stable

8) Which of the following is closed loop system?
   a) Electric switch
   b) D-C generator
   c) car starter
   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)

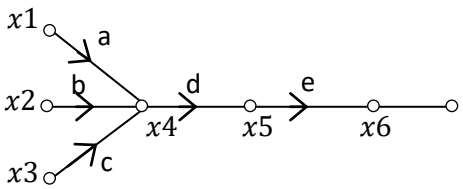
10) A control system in which control action is dependent on output is known as_____.
   a) Open loop system
   b) semiclosed system
   c) closed system
   d) indeterminist

11) The characteristics equation (S +1)(S +2)(S - 3) represents a _____.
   a) Stable system
   b) unstable system
   c) marginally stable
   d) indeterminist

12) The transfer function $\mathrm{P}(\mathrm{S}) = \frac{(2\mathrm{S}+1)}{(\mathrm{S}^2+\mathrm{S}+1)}$ represents.
   a) Stable system
   b) unstable system
   c) marginally stable
   d) indeterminist

13) Which of following element is not used in automatic control system?
   a) Sensor
   b) error detector
   c) Oscillator
   d) final control element

14) From the signal flow graph shown in figure below, x6=



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

Seat No.	

Set **Q**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

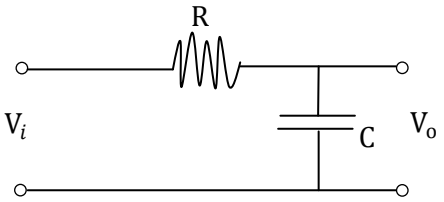
Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four questions. **16**

a) Define control system. Explain types of control system

b) Find transfer function of following system.

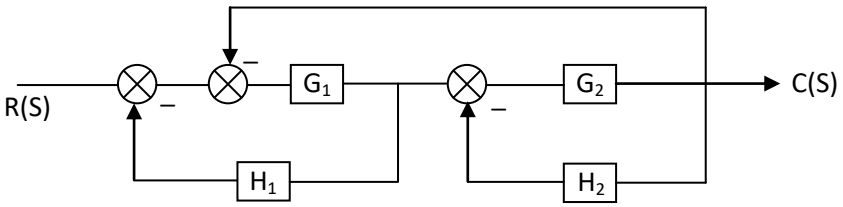


c) Check stability of $2S^4 + 2S^3 + S^2 + 3S + 2 = 0$

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

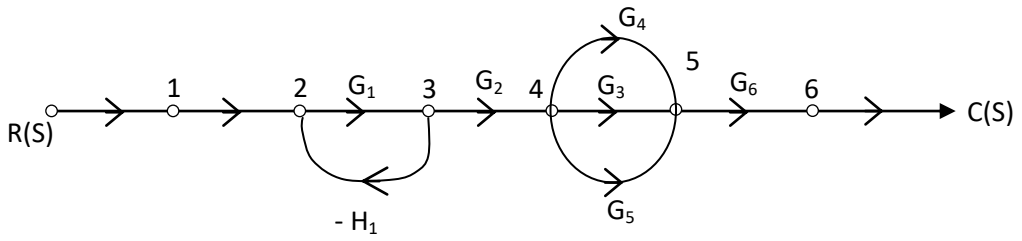
Q.3 a) Find transfer function of system given in figure. **06**



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

OR

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



Section – II

Q.4 Attempt any four questions. **16**

a) Determine different error constants for a system having

$G(S) = \frac{K}{S(S^2+2S+5)}$ $H(S) = \frac{10}{S+4}$

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)

e) Explain rules for construction of root locus.

Q.5 Attempt any two **12**

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

$G(S) = \frac{K}{S(S+4)(S+5)}$

Sketch root locus as K varies from zero to infinity.

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

1) natural frequency of oscillation
2) damping factor
3) damping frequency
4) peak time tp
5) delay time td
6) peak overshoot Mp

c) Sketch Bode plot for transfer function

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

Determine

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

Seat No.	

Set **R**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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

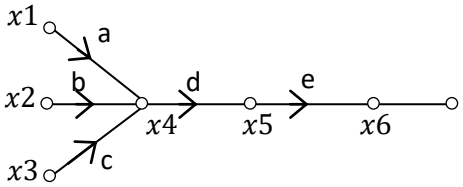
Duration: 30 Minutes Marks: 14

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

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

2) Which of following element is not used in automatic control system?
   a) Sensor b) error detector
   c) Oscillator d) final control element

3) From the signal flow graph shown in figure below, x6=



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

4) Which of the following compensator will be used to increase the bandwidth of a control system?
   a) phase lag b) phase lag lead
   c) phase lead d) none of above

5) For making an unstable system stable _____.
   a) gain of system should be increased
   b) gain of system should be decreased
   c) the number of zeros to the open loop transfer function should be increased
   d) the number of poles to the open loop transfer function should be increased

6) What will be nature of system, if the poles of system are lying on the imaginary axis in S-plane?
   a) marginally stable b) conditionally stable
   c) stable d) Zero

7) Damping is proportional to _____.
   a) gain
   b) $\frac{1}{\text{gain}}$
   c) $\sqrt{\text{gain}}$
   d) $\frac{1}{\sqrt{\text{gain}}}$

8) The type 1 system has _____at the origin.
   a) no pole
   b) no zero
   c) simple pole
   d) two poles

9) Lag compensator reduces _____.
   a) bandwidth
   b) rise time
   c) transient response
   d) all of these

10) If both gain and phase margin are positive then the system is _____.
   a) stable
   b) unstable
   c) indeterminist
   d) marginally stable

11) Which of the following is closed loop system?
   a) Electric switch
   b) D-C generator
   c) car starter
   d) Autopiolet for an air craft

12) The current in electrical circuit is analogous to _____in mechanical translational system.
   a) Mass (M)
   b) displacement (x)
   c) velocity
   d) force (F)

13) A control system in which control action is dependent on output is known as_____.
   a) Open loop system
   b) semiclosed system
   c) closed system
   d) indeterminist

14) The characteristics equation (S +1)(S +2)(S - 3) represents a _____.
   a) Stable system
   b) unstable system
   c) marginally stable
   d) indeterminist

Seat No.	

Set **R**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

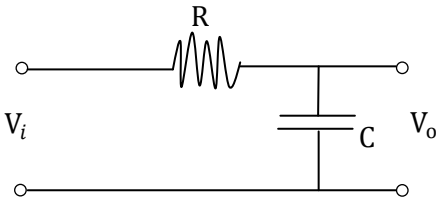
Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four questions. **16**

a) Define control system. Explain types of control system

b) Find transfer function of following system.

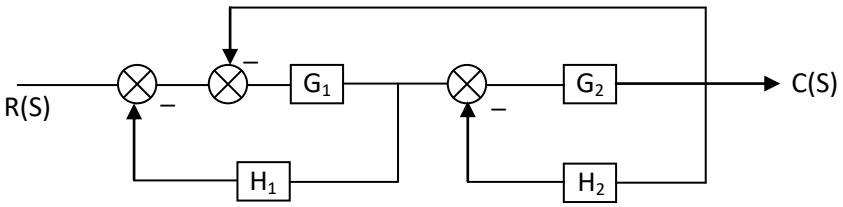


c) Check stability of $2S^4 + 2S^3 + S^2 + 3S + 2 = 0$

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

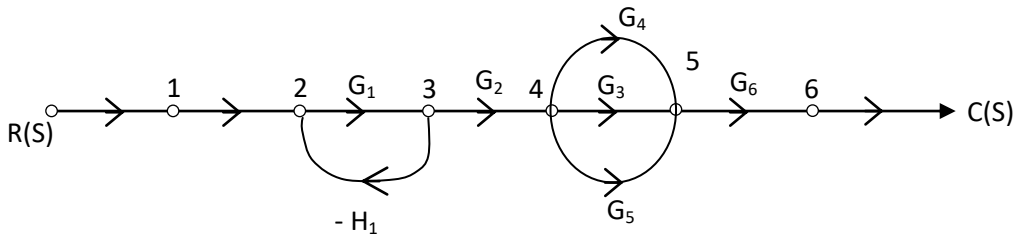
Q.3 a) Find transfer function of system given in figure. **06**



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

OR

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



Section – II

Q.4 Attempt any four questions. **16**

a) Determine different error constants for a system having

$G(S) = \frac{K}{S(S^2+2S+5)}$ $H(S) = \frac{10}{S+4}$

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)

e) Explain rules for construction of root locus.

Q.5 Attempt any two **12**

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

$G(S) = \frac{K}{S(S+4)(S+5)}$

Sketch root locus as K varies from zero to infinity.

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

1) natural frequency of oscillation
2) damping factor
3) damping frequency
4) peak time tp
5) delay time td
6) peak overshoot Mp

c) Sketch Bode plot for transfer function

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

Determine

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

Seat No.	

Set **S**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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 Marks: 14

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

1) What will be nature of system, if the poles of system are lying on the imaginary axis in S-plane?
   a) marginally stable b) conditionally stable
   c) stable d) Zero

2) Damping is proportional to _____.
   a) gain b) $\frac{1}{\text{gain}}$
   c) $\sqrt{\text{gain}}$ d) $\frac{1}{\sqrt{\text{gain}}}$

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
   c) car starter d) Autopiolet for an air craft

7) The current in electrical circuit is analogous to _____in mechanical translational system.
   a) Mass (M) b) displacement (x)
   c) velocity d) force (F)

8) A control system in which control action is dependent on output is known as_____.
   a) Open loop system b) semiclosed system
   c) closed system d) indeterminist

9) The characteristics equation (S +1)(S +2)(S - 3) represents a _____.
   a) Stable system
   b) unstable system
   c) marginally stable
   d) indeterminist

10) The transfer function $P(S) = \frac{(2S+1)}{(S^2+S+1)}$ represents.
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11) Which of following element is not used in automatic control system?
   a) Sensor
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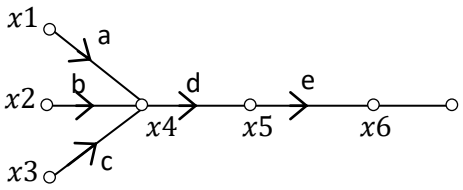
   d) final control element

12) From the signal flow graph shown in figure below, x6=



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

13) Which of the following compensator will be used to increase the bandwidth of a control system?
   a) phase lag
   b) phase lag lead
   c) phase lead
   d) none of above

14) For making an unstable system stable _____.
   a) gain of system should be increased
   b) gain of system should be decreased
   c) the number of zeros to the open loop transfer function should be increased
   d) the number of poles to the open loop transfer function should be increased

Seat No.	

Set **S**

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

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

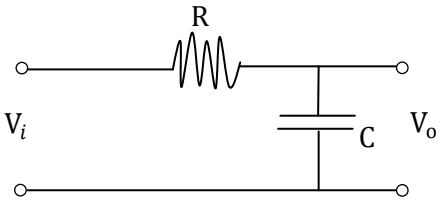
Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four questions. **16**

a) Define control system. Explain types of control system

b) Find transfer function of following system.

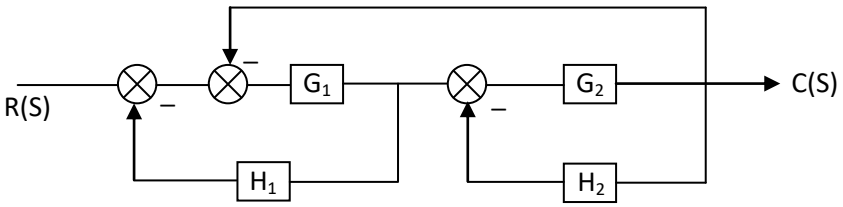


c) Check stability of $2S^4 + 2S^3 + S^2 + 3S + 2 = 0$

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

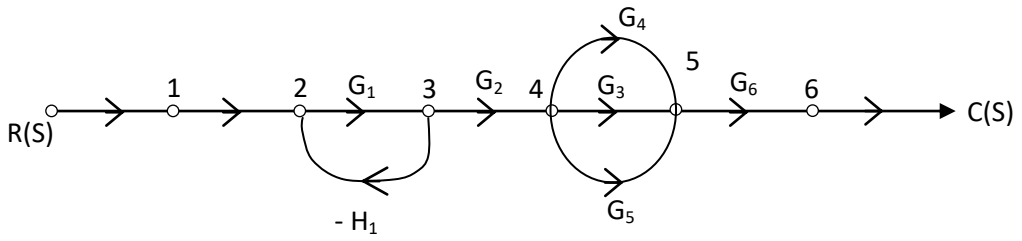
Q.3 a) Find transfer function of system given in figure. **06**



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

OR

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



Section – II

Q.4 Attempt any four questions. **16**

a) Determine different error constants for a system having

$G(S) = \frac{K}{S(S^2+2S+5)}$ $H(S) = \frac{10}{S+4}$

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)

e) Explain rules for construction of root locus.

Q.5 Attempt any two **12**

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

$G(S) = \frac{K}{S(S+4)(S+5)}$

Sketch root locus as K varies from zero to infinity.

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

1) natural frequency of oscillation
2) damping factor
3) damping frequency
4) peak time tp
5) delay time td
6) peak overshoot Mp

c) Sketch Bode plot for transfer function

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

Determine

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

Seat No.	

Set **P**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) $A_f=1+(R_f/R_1)$ represents _____.
   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

2) For summing amplifier ratio of R_f/R should be _____.
   a) less than one b) greater than one
   c) zero d) one

3) Introduction of negative feedback _____.
   a) makes gain infinite b) make bandwidth infinite
   c) stabilizes gain d) none of these

4) Gain bandwidth product of IC741 is _____.
   a) 10 MHz b) 1MHz
   c) Infinite d) 1KHz

5) Vo_{cm}/V_{cm} represents _____.
   a) CMRR b) open loop voltage gain
   c) A_{cm} d) voltage rejection ratio

6) Maximum value of dV_o/dt is called _____.
   a) voltage ratio b) voltage rate
   c) slew rate d) transient response

7) The gain of the basic differentiator increases with increase in frequency till it touches open loop response _____.
   a) True b) False

8) 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

9) For peak detector which of the following is true _____.
   a) $CR_d \leq T/10$ b) $CR_L \geq 10T$
   c) Both a and b d) None of these

10) _____ circuit converts irregular shape into square wave or pulse.
   a) Schmitt Trigger b) Clamper
   c) Peak Detector d) Window Detector

11) Which of the following circuit is called as dc inserter?
   a) dc amplifier b) Schmitt trigger
   c) Clampers d) Zero crossing Detector

12) Which block of PLL provides flywheel action for smoothing as dc inserter?
   a) Filter b) VCO
   c) Phase Detector d) Level Shifter

13) Active filters offers below advantages over passive filters _____.
   a) Flexibility in design b) Gain adjustment
   c) Both a and b d) None of these

14) For a quadrature oscillator, If fo = 1.59KHz and C=0.01 μF then R=?
   a) 10KΩ b) 100 KΩ
   c) 1KΩ d) 15.9 KΩ

Seat No.	

Set **P**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

a) Consider an inverting amplifier with feedback with R_f=5KΩ, R_1=100Ω, 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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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

2) For peak detector which of the following is true _____.
   a) $CR_d \leq T/10$ b) $CR_L \geq 10T$
   c) Both a and b d) None of these

3) _____ circuit converts irregular shape into square wave or pulse.
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4) Which of the following circuit is called as dc inserter?
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5) Which block of PLL provides flywheel action for smoothing as dc inserter?
   a) Filter b) VCO
   c) Phase Detector d) Level Shifter

6) Active filters offers below advantages over passive filters _____.
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   c) Both a and b d) None of these

7) For a quadrature oscillator, If fo = 1.59KHz and C=0.01 μF then R=?
   a) 10KΩ b) 100 KΩ
   c) 1KΩ d) 15.9 KΩ

8) $A_f = 1+(R_f/R_1)$ represents _____.
   a) open loop gain of Non-Inverting Amplifier
   b) closed loop gain of Non-Inverting Amplifier
   c) open loop gain of Inverting Amplifier
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   a) less than one b) greater than one
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10) Introduction of negative feedback _____.
   a) makes gain infinite b) make bandwidth infinite
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11) Gain bandwidth product of IC741 is _____.
   a) 10 MHz b) 1MHz
   c) Infinite d) 1KHz

12) Vo_{cm}/V_{cm} represents _____.
   a) CMRR b) open loop voltage gain
   c) A_{cm} d) voltage rejection ratio

13) Maximum value of dV_o/dt is called _____.
   a) voltage ratio b) voltage rate
   c) slew rate d) transient response

14) The gain of the basic differentiator increases with increase in frequency till it touches open loop response _____.
   a) True b) False

Seat No.	

Set **Q**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

a) Consider an inverting amplifier with feedback with R_f=5KΩ, R_1=100Ω, 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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **R**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) Vo_{cm}/V_{cm} represents _____.
   a) CMRR b) open loop voltage gain
   c) A_{cm} d) voltage rejection ratio

2) Maximum value of dV_o/dt is called _____.
   a) voltage ratio b) voltage rate
   c) slew rate d) transient response

3) The gain of the basic differentiator increases with increase in frequency till it touches open loop response _____.
   a) True b) False

4) 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

5) For peak detector which of the following is true _____.
   a) $CR_d \leq T/10$ b) $CR_L \geq 10T$
   c) Both a and b d) None of these

6) _____ circuit converts irregular shape into square wave or pulse.
   a) Schmitt Trigger b) Clamper
   c) Peak Detector d) Window Detector

7) Which of the following circuit is called as dc inserter?
   a) dc amplifier b) Schmitt trigger
   c) Clampers d) Zero crossing Detector

8) Which block of PLL provides flywheel action for smoothing as dc inserter?
   a) Filter b) VCO
   c) Phase Detector d) Level Shifter

9) Active filters offers below advantages over passive filters _____.
   a) Flexibility in design b) Gain adjustment
   c) Both a and b d) None of these

10) For a quadrature oscillator, If fo = 1.59KHz and C=0.01 μF then R=?
   a) 10KΩ b) 100 KΩ
   c) 1KΩ d) 15.9 KΩ

11) $A_f=1+(R_f/R_1)$ represents _____.
   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

12) For summing amplifier ratio of R_f/R should be _____.
   a) less than one b) greater than one
   c) zero d) one

13) Introduction of negative feedback _____.
   a) makes gain infinite b) make bandwidth infinite
   c) stabilizes gain d) none of these

14) Gain bandwidth product of IC741 is _____.
   a) 10 MHz b) 1MHz
   c) Infinite d) 1KHz

Seat No.	

Set **R**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

a) Consider an inverting amplifier with feedback with R_f=5KΩ, R_1=100Ω, 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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **S**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) _____ circuit converts irregular shape into square wave or pulse.
   a) Schmitt Trigger b) Clamper
   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

3) Which block of PLL provides flywheel action for smoothing as dc inserter?
   a) Filter b) VCO
   c) Phase Detector d) Level Shifter

4) Active filters offers below advantages over passive filters _____.
   a) Flexibility in design b) Gain adjustment
   c) Both a and b d) None of these

5) For a quadrature oscillator, If fo = 1.59KHz and C=0.01 µF then R=?
   a) 10KΩ b) 100 KΩ
   c) 1KΩ d) 15.9 KΩ

6) $A_f=1+(R_f/R_1)$ represents _____.
   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

7) For summing amplifier ratio of R_f/R should be _____.
   a) less than one b) greater than one
   c) zero d) one

8) Introduction of negative feedback _____.
   a) makes gain infinite b) make bandwidth infinite
   c) stabilizes gain d) none of these

9) Gain bandwidth product of IC741 is _____.
   a) 10 MHz b) 1MHz
   c) Infinite d) 1KHz

10) Vo_{cm}/V_{cm} represents _____.
   a) CMRR
   b) open loop voltage gain
   c) A_{cm}
   d) voltage rejection ratio

11) Maximum value of dV_o/dt is called _____.
   a) voltage ratio
   b) voltage rate
   c) slew rate
   d) transient response

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) $CR_L \geq 10T$
   c) Both a and b
   d) None of these

Seat No.	

Set **S**

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

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

a) Consider an inverting amplifier with feedback with R_f=5KΩ, R_1=100Ω, 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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **P**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) If x[4-n] is derived from the x[n] by which transformation?
   a) Reversal and shift b) reversal only
   c) Scaling d) scaling and shifting

2) Mathematically unit impulse is a derivative of _____.
   a) Unit step b) unit ramp
   c) Unit parabola d) None

3) With u(n) as unit step function, u(n)-u(n-2) is.
   a) $\delta(n)$ b) $\delta(n) + \delta(n-1)$
   c) $\delta(n) + \delta(n-2)$ d) $\delta(n) + \delta(n+1)$

4) Which system is non-causal system?
   a) $y(t) = x(t+1)$ b) $y(t) = x(t-1)$
   c) $y(t) = x(t) + c$ 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) $\{0,4,3,1\}$
   c) $\{1,4,7,6\}$ d) $\{4,2,3,1\}$

6) Time transformations are _____.
   a) Time shifting b) Time scaling
   c) Time reversal d) All

7) Find the time period of $x(t) = \sin(50t)$ _____.
   a) 25π b) 50
   c) $\pi/2$ d) $\pi/25$

8) For the successful reconstruction of signals _____.
   a) Sampling frequency must be equal to the message signal
   b) Sampling frequency must be greater to the message signal
   c) Sampling frequency must be less to the message signal
   d) Sampling frequency must be greater than or equal to the message signal

9) What is the z-transform of the finite duration signal _____.
   $x(n) = \{2,4,5,7,0,1\}$?
   a) $2 + 4z + 5z^2 + 7z^3 + z^4$ b) $2 + 4z + 5z^2 + 7z^3 + z^5$
   c) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ d) $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$

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) $ax(n) + by(n) \leftrightarrow aX(z)bY(z)$
   b) $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$
   c) $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$
   d) $ax(n)by(n) \leftrightarrow aX(z)bY(z)$

12) Duality property is _____.
   a) $X(t) \leftrightarrow 2\pi x(-w)$
   b) $X(-t) \leftrightarrow 2x(-w)$
   c) $X(at) \leftrightarrow 1/a\, X(w/a)$
   d) $(-jt)\, X(t) \leftrightarrow 2x\pi(-w)$

13) Fourier transform of Sgn (t) is _____.
   a) 1
   b) -2/jw
   c) 2/jw
   d) 0

14) What does the first term 'a0' in the below stated expression of a line spectrum indicate?

$$x(t) = a0 + a1 \cos w0t + a2 \cos 2\, w0t + \cdots + b1 \sin w0\, t + b2 \sin w0\, t + \ldots$$

   a) DC component
   b) Fundamental component
   c) Second harmonic component
   d) All of the above

Seat No.	

Set **P**

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

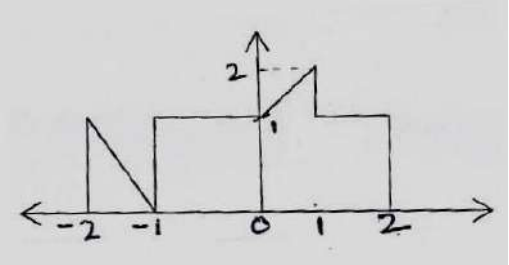
Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if necessary

Section – I

Q.2 Attempt any three of the following questions. **12**

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



b) Check the causal/non-causal and Linear/Non-linear $Y(t)=e^{x(t)}$.
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. **16**

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 $x(n)=\{3,2,1,\underset{\uparrow}{1},1,2,1,1\}$.

Section – II

Q.4 Attempt any three of the following questions. **12**

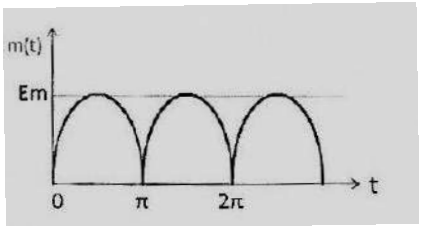
a) Define Aliasing error. Explain how it can be avoided?
b) Find Z-transform with its ROC of $x(n)=(2)^n.u(n)+(3)^n.u(-n-1)$.
c) Find inverse Z- transform $X(Z)=\frac{Z^2+Z}{(Z-1)^2}$, Right sided sequence using partial fraction expansion method.
d) Find Fourier transform of $x(t)=\cos W_0 t$.

Q.5 Attempt any two of the following questions. **16**

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.

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

c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and $\mathrm{T}_0 = \pi$



Seat No.		Set	Q

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) For the successful reconstruction of signals _____.
   a) Sampling frequency must be equal to the message signal
   b) Sampling frequency must be greater to the message signal
   c) Sampling frequency must be less to the message signal
   d) Sampling frequency must be greater than or equal to the message signal

2) What is the z-transform of the finite duration signal _____.
   $x(n) = \{2,4,5,7,0,1\}$?
   a) $2 + 4z + 5z^2 + 7z^3 + z^4$ b) $2 + 4z + 5z^2 + 7z^3 + z^5$
   c) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ 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
   b) Entire Z plane, expect $z = 0$
   c) Entire Z plane, expect $z = \infty$
   d) Entire Z plane, expect $z = 0$ and expect $z = \infty$

4) 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) $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$
   c) $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$ d) $ax(n)by(n) \leftrightarrow aX(z)bY(z)$

5) Duality property is _____.
   a) $X(t) \leftrightarrow 2\pi x(-w)$ b) $X(-t) \leftrightarrow 2x(-w)$
   c) $X(at) \leftrightarrow 1/a\, X(w/a)$ d) $(-jt)\, X(t) \leftrightarrow 2x\pi(-w)$

6) Fourier transform of Sgn (t) is _____.
   a) 1 b) -2/jw
   c) 2/jw d) 0

7) What does the first term 'a0' in the below stated expression of a line spectrum indicate?
   $x(t) = a0 + a1 \cos w0t + a2 \cos 2\, w0t + \cdots + b1 \sin w0\, t + b2 \sin w0\, t + \ldots$
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8) If x[4-n] is derived from the x[n] by which transformation?
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   c) Scaling
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9) Mathematically unit impulse is a derivative of _____.
   a) Unit step
   b) unit ramp
   c) Unit parabola
   d) None

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   a) $\delta(n)$
   b) $\delta(n) + \delta(n-1)$
   c) $\delta(n) + \delta(n-2)$
   d) $\delta(n) + \delta(n+1)$

11) Which system is non-causal system?
   a) $y(t) = x(t+1)$
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   c) $y(t) = x(t) + c$
   d) $y(t) = x(t) - c$

12) 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) $\{4,2,3,1\}$

13) Time transformations are _____.
   a) Time shifting
   b) Time scaling
   c) Time reversal
   d) All

14) Find the time period of $x(t) = \sin(50t)$ _____.
   a) 25π
   b) 50
   c) $\pi/2$
   d) $\pi/25$

Seat No.	

Set **Q**

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

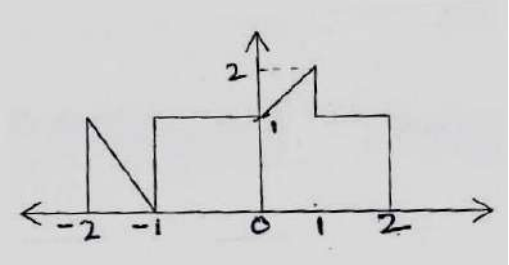
Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if necessary

Section – I

Q.2 Attempt any three of the following questions. **12**

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



b) Check the causal/non-causal and Linear/Non-linear $Y(t)=e^{x(t)}$.
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. **16**

a) Explain the transformations on independent variables with examples.
b) Determine following system is y(t)= even {x(t)}.
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2) Linear/Non-linear
3) Time Variant- invariant
c) Find even and odd part of the given signal $x(n)=\{3,2,1,\underset{\uparrow}{1},1,2,1,1\}$.

Section – II

Q.4 Attempt any three of the following questions. **12**

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 $x(t)=\cos W_0 t$.

Q.5 Attempt any two of the following questions. **16**

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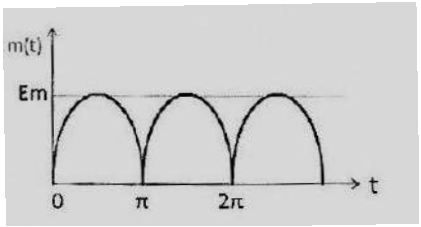
$$X[Z]=\frac{Z^2+Z}{Z^3-3Z^2+3Z-1};|z|>1 \text{ ROC}$$

c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and $\mathrm{T}_0 = \pi$



Seat No.	

Set **R**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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) $\{4,2,3,1\}$

2) Time transformations are _____.
   a) Time shifting b) Time scaling
   c) Time reversal d) All

3) Find the time period of $x(t) = \sin(50t)$ _____.
   a) 25π b) 50
   c) $\pi/2$ d) $\pi/25$

4) For the successful reconstruction of signals _____.
   a) Sampling frequency must be equal to the message signal
   b) Sampling frequency must be greater to the message signal
   c) Sampling frequency must be less to the message signal
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5) What is the z-transform of the finite duration signal _____.
   $x(n) = \{2,4,5,7,0,1\}$?
   a) $2 + 4z + 5z^2 + 7z^3 + z^4$ b) $2 + 4z + 5z^2 + 7z^3 + z^5$
   c) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ d) $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$

6) If x(n)=u(n)-u(n-4) then ROC is _____.
   a) Entire Z plane
   b) Entire Z plane, expect $z = 0$
   c) Entire Z plane, expect $z = \infty$
   d) Entire Z plane, expect $z = 0$ and expect $z = \infty$

7) Which of the following justifies the linearity property of z-transform?
   $[x(n) \leftrightarrow X(z)]$.
   a) $ax(n) + by(n) \leftrightarrow aX(z)bY(z)$ b) $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$
   c) $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$ d) $ax(n)by(n) \leftrightarrow aX(z)bY(z)$

8) Duality property is _____.
   a) $X(t) \leftrightarrow 2\pi x(-w)$ b) $X(-t) \leftrightarrow 2x(-w)$
   c) $X(at) \leftrightarrow 1/a\ X(w/a)$ d) $(-jt)\ X(t) \leftrightarrow 2x\pi(-w)$

9) Fourier transform of Sgn (t) is _____.
   a) 1 b) -2/jw
   c) 2/jw d) 0

10) What does the first term 'a0' in the below stated expression of a line spectrum indicate?

$$x(t) = a0 + a1\cos w0t + a2\cos 2\ w0t + \cdots + b1\sin w0\ t + \ b2\sin w0\ t + \ldots$$

a) DC component
b) Fundamental component
c) Second harmonic component
d) All of the above

11) If x[4-n] is derived from the x[n] by which transformation?

a) Reversal and shift
b) reversal only
c) Scaling
d) scaling and shifting

12) Mathematically unit impulse is a derivative of _____.

a) Unit step
b) unit ramp
c) Unit parabola
d) None

13) With u(n) as unit step function, u(n)-u(n-2) is.

a) $\delta(n)$
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) $y(t) = x(t) + c$
d) $y(t) = x(t) - c$

Seat No.	

Set **R**

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

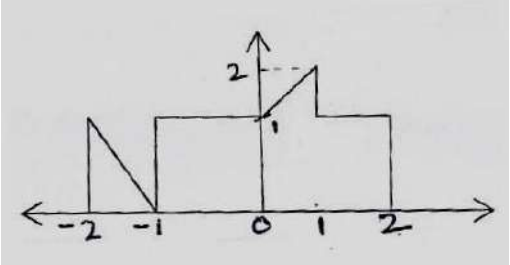
Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if necessary

Section – I

Q.2 Attempt any three of the following questions. **12**

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



b) Check the causal/non-causal and Linear/Non-linear $Y(t)=e^{x(t)}$.
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. **16**

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 $x(n)=\{3,2,1,\underset{\uparrow}{1},1,2,1,1\}$.

Section – II

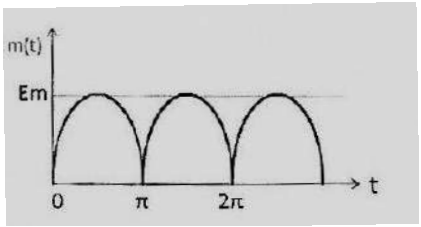
Q.4 Attempt any three of the following questions. **12**

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 $x(t)=\cos W_0 t$.

Q.5 Attempt any two of the following questions. **16**

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

c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and $\mathrm{T}_0 = \pi$



Seat No.	

Set **S**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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 $z = \infty$

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) $ax(n) + by(n) \leftrightarrow aX(z) + bY(z)$
   c) $ax(n)by(n) \leftrightarrow aX(z) + bY(z)$ d) $ax(n)by(n) \leftrightarrow aX(z)bY(z)$

3) Duality property is _____.
   a) $X(t) \leftrightarrow 2\pi x(-w)$ b) $X(-t) \leftrightarrow 2x(-w)$
   c) $X(at) \leftrightarrow 1/a\, X(w/a)$ d) $(-jt)\, X(t) \leftrightarrow 2x\pi(-w)$

4) Fourier transform of Sgn (t) is _____.
   a) 1 b) -2/jw
   c) 2/jw d) 0

5) What does the first term 'a0' in the below stated expression of a line spectrum indicate?
   $x(t) = a0 + a1 \cos w0t + a2 \cos 2\, w0t + \cdots + b1 \sin w0\, t + b2 \sin w0\, t + \ldots$
   a) DC component b) Fundamental component
   c) Second harmonic component d) All of the above

6) If x[4-n] is derived from the x[n] by which transformation?
   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

8) With u(n) as unit step function, u(n)-u(n-2) is.
   a) $\delta(n)$ b) $\delta(n) + \delta(n-1)$
   c) $\delta(n) + \delta(n-2)$ d) $\delta(n) + \delta(n+1)$

9) Which system is non-causal system?
   a) $y(t) = x(t+1)$ b) $y(t) = x(t-1)$
   c) $y(t) = x(t) + c$ d) $y(t) = x(t) - c$

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 _____.
   a) Time shifting b) Time scaling
   c) Time reversal d) All

12) Find the time period of $x(t) = \sin(50t)$ _____.
   a) 25π b) 50
   c) $\pi/2$ d) $\pi/25$

13) For the successful reconstruction of signals _____.
   a) Sampling frequency must be equal to the message signal
   b) Sampling frequency must be greater to the message signal
   c) Sampling frequency must be less to the message signal
   d) Sampling frequency must be greater than or equal to the message signal

14) What is the z-transform of the finite duration signal _____.
   $x(n) = \{2,4,5,7,0,1\}$?
   a) $2 + 4z + 5z^2 + 7z^3 + z^4$ b) $2 + 4z + 5z^2 + 7z^3 + z^5$
   c) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ d) $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$

Seat No.	

Set **S**

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

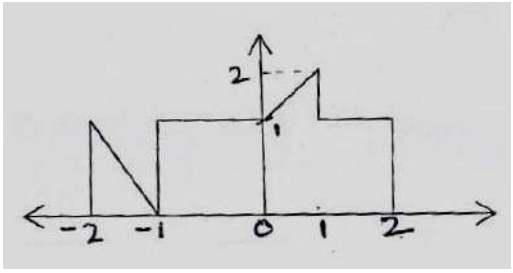
Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if necessary

Section – I

Q.2 Attempt any three of the following questions. **12**

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



b) Check the causal/non-causal and Linear/Non-linear $Y(t)=e^{x(t)}$.
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. **16**

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 $x(n)=\{3,2,1,\underset{\uparrow}{1},1,2,1,1\}$.

Section – II

Q.4 Attempt any three of the following questions. **12**

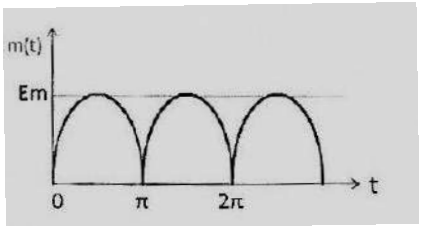
a) Define Aliasing error. Explain how it can be avoided?
b) Find Z-transform with its ROC of $x(n)=(2)^n.u(n)+(3)^n.u(-n-1)$.
c) Find inverse Z- transform $X(Z)=\frac{Z^2+Z}{(Z-1)^2}$, Right sided sequence using partial fraction expansion method.
d) Find Fourier transform of $x(t)=\cos W_0 t$.

Q.5 Attempt any two of the following questions. **16**

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.

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

c) Find the exponential Fourier series & plot the magnitude & phase spectrum of full wave rectified time domain signal having amplitude Em and $\mathrm{T}_0 = \pi$



Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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

2) Which of the following is meaningless combination?
   a) grad div b) curl div
   c) curl grad d) none of these

3) If the direction of Coulomb's Force on a unit charge is $\overline{\mathrm{ax}}$, the direction of electric field intensity is _____.
   a) $\overline{\mathrm{ay}}$ b) -$\overline{\mathrm{ax}}$
   c) $\overline{\mathrm{az}}$ d) $\overline{\mathrm{ax}}$

4) If pair of $+ve$ & $-ve$ charges of 2C separated by distance $3\mu\mathrm{m}$ then the magnitude of dipole moment is _____.
   a) $2\ C-\ \mu m$ b) $1.5\ C-\ m$
   c) $6\ C-\ \mu m$ d) $3\ C-\ \mu m$

5) If E is a vector then $\nabla.\nabla\times E$ is _____.
   a) 1 b) 0
   c) ∞ d) doesn't exist

6) The unit of Electric field Intensity is _____.
   a) N/C b) V-m
   c) J-C/m d) All of these

7) If the voltage applied across the capacitor is increased, the capacitance value _____.
   a) increases b) Decreases
   c) remains constant d) becomes infinity

8) A quantitative relation between induced emf and rate of change of flux linkage is known as _____.
   a) Maxwell's law b) Stoke's law
   c) Lenz's law d) Faraday's law

9) What is the flux density of a magnetic field whose flux is 3000 μWb and cross-sectional area is 0.25 m^2?
   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) $P = \overline{E} \,.\, \overline{H}$
   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) $\mu r = 1, \varepsilon r = 4$ and $\sigma = 0$
   2) $\mu r = 4, \varepsilon r = 4$ and $\sigma = 0$

   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
   c) 1:1
   d) 2:2

Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 56
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. **12**

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 $\bar{p} = 3\,\bar{a}x - 2\,\bar{a}y + \bar{a}z\,nC\text{-}m$. Find V at $P(2,3,4)$.

Q.3 Attempt any two. **16**

a) Find $\bar{E}$ 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^2 is placed at $y = 3$.

b) Derive the equation for $\bar{E}$ due to infinite sheet charge placed in z=0 plane.

c) Establish the boundary condition for dielectric boundary having permeability ε_1 and ε_2.

Section – II

Q.4 Attempt any three. **12**

a) State and explain Ampere's circuital law.

b) Write a note on antenna field zones.

c) In a medium if $\bar{E} = Em \sin \propto \cos(wt - \beta z)\,\bar{a}y\ V/m$ find $\bar{H}$.

d) If magnetic field intensity in a region is $\bar{H} = x^2\bar{a}x + 2yz\,\bar{a}y - x^2\bar{a}z$ find current density at point P(2,3,4).

Q.5 Attempt any two. **16**

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 $\bar{H} = \left(\frac{y^2 z}{x}\right)\bar{a}x + \left(0.5\,\frac{y^2 z^2}{x^2}\right)\bar{a}z$ 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.

Seat No.	

Set **Q**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A quantitative relation between induced emf and rate of change of flux linkage is known as _____.
   a) Maxwell's law b) Stoke's law
   c) Lenz's law 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 m^2?
   a) 12,000 μT
   b) 83330 T
   c) 0 T
   d) insufficient information provided

3) 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

4) 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

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
   c) twice that produced by one coil
   d) half of that produced by one coil

6) 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) $P = \nabla.(\overline{E} \times \overline{H})$

7) Two media are characterized as _____.
1) $\mu r = 1, \varepsilon r = 4$ and $\sigma = 0$ 2) $\mu r = 4, \varepsilon r = 4$ and $\sigma = 0$
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
c) 1:1 d) 2:2

8) A point is obtained by intersection of _____ in spherical co-ordinates.
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c) plane, circle and a cone d) none of these

9) Which of the following is meaningless combination?
a) grad div b) curl div
c) curl grad d) none of these

10) If the direction of Coulomb's Force on a unit charge is $\overline{ax}$, the direction of electric field intensity is _____.
a) $\overline{ay}$ b) -$\overline{ax}$
c) $\overline{az}$ d) $\overline{ax}$

11) If pair of $+ve$ & $-ve$ charges of 2C separated by distance $3\mu m$ then the magnitude of dipole moment is _____.
a) $2\ C - \mu m$ b) $1.5\ C - m$
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12) If E is a vector then $\nabla . \nabla \times E$ is _____.
a) 1 b) 0
c) ∞ d) doesn't exist

13) The unit of Electric field Intensity is _____.
a) N/C b) V-m
c) J-C/m d) All of these

14) If the voltage applied across the capacitor is increased, the capacitance value _____.
a) increases b) Decreases
c) remains constant d) becomes infinity

SLR-FM-237

Seat No.	

Set Q

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 56
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. **12**

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 $\bar{p} = 3\,\bar{a}x - 2\,\bar{a}y + \bar{a}z\,nC\text{-}m$. Find V at $P(2,3,4)$.

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a) Find $\bar{E}$ 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^2 is placed at $y = 3$.

b) Derive the equation for $\bar{E}$ due to infinite sheet charge placed in z=0 plane.

c) Establish the boundary condition for dielectric boundary having permeability ε_1 and ε_2.

Section – II

Q.4 Attempt any three. **12**

a) State and explain Ampere's circuital law.

b) Write a note on antenna field zones.

c) In a medium if $\bar{E} = Em \sin \propto \cos(wt - \beta z)\,\bar{a}y\ V/m$ find $\bar{H}$.

d) If magnetic field intensity in a region is $\bar{H} = x^2\bar{a}x + 2yz\,\bar{a}y - x^2\bar{a}z$ find current density at point P(2,3,4).

Q.5 Attempt any two. **16**

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 $\bar{H} = \left(\frac{y^2 z}{x}\right)\bar{a}x + \left(0.5\,\frac{y^2 z^2}{x^2}\right)\bar{a}z$ 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.

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) If E is a vector then $\nabla.\nabla \times E$ is _____.
   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 capacitance value _____.
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4) A quantitative relation between induced emf and rate of change of flux linkage is known as _____.
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5) What is the flux density of a magnetic field whose flux is 3000 μWb and cross-sectional area is 0.25 m^2?
   a) 12,000 μT
   b) 83330 T
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   d) insufficient information provided

6) When the speed at which a conductor is moved through a magnetic field is increased, the induced voltage _____
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   c) remains constant d) reaches zero

7) One of this is NOT the source of magnetic fields _____.
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   b) a permanent magnet
   c) an accelerated charge
   d) an electric field linearly changing with time

8) 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

9) Poynting vector is _____.
   a) $\mathrm{P} = \overline{\mathrm{E}} \,.\, \overline{\mathrm{H}}$
   b) $\mathrm{P} = 1/2(\overline{\mathrm{E}} \times \overline{\mathrm{H}})$
   c) $\mathrm{P} = \overline{\mathrm{E}} \times \overline{\mathrm{H}}$
   d) $\mathrm{P} = \nabla.\,(\overline{\mathrm{E}} \times \overline{\mathrm{H}})$

10) Two media are characterized as _____.
   1) $\mu\mathrm{r} = 1, \varepsilon\mathrm{r} = 4$ and $\sigma = 0$
   2) $\mu\mathrm{r} = 4, \varepsilon\mathrm{r} = 4$ and $\sigma = 0$

   Where: $\varepsilon\mathrm{r} =$ relative permittivity, $\mu\mathrm{r} =$ 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
   c) 1:1
   d) 2:2

11) 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

12) Which of the following is meaningless combination?
   a) grad div
   b) curl div
   c) curl grad
   d) none of these

13) If the direction of Coulomb's Force on a unit charge is $\overline{\mathrm{ax}}$, the direction of electric field intensity is _____.
   a) $\overline{\mathrm{ay}}$
   b) -$\overline{\mathrm{ax}}$
   c) $\overline{\mathrm{az}}$
   d) $\overline{\mathrm{ax}}$

14) If pair of $+ve$ & $-ve$ charges of 2C separated by distance $3\mu\mathrm{m}$ then the magnitude of dipole moment is _____.
   a) $2\ C - \mu m$
   b) $1.5\ C - m$
   c) $6\ C - \mu m$
   d) $3\ C - \mu m$

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 56
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. **12**

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 $\bar{p} = 3\,\bar{a}x - 2\,\bar{a}y + \bar{a}z\,nC\text{-}m$. Find V at $P(2,3,4)$.

Q.3 Attempt any two. **16**

a) Find $\bar{E}$ 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^2 is placed at $y = 3$.

b) Derive the equation for $\bar{E}$ due to infinite sheet charge placed in z=0 plane.

c) Establish the boundary condition for dielectric boundary having permeability ε_1 and ε_2.

Section – II

Q.4 Attempt any three. **12**

a) State and explain Ampere's circuital law.

b) Write a note on antenna field zones.

c) In a medium if $\bar{E} = Em \sin \propto \cos(wt - \beta z)\,\bar{a}y\ V/m$ find $\bar{H}$.

d) If magnetic field intensity in a region is $\bar{H} = x^2\bar{a}x + 2yz\,\bar{a}y - x^2\bar{a}z$ find current density at point P(2,3,4).

Q.5 Attempt any two. **16**

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 $\bar{H} = \left(\frac{y^2 z}{x}\right)\bar{a}x + \left(0.5\,\frac{y^2 z^2}{x^2}\right)\bar{a}z$ 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.

SLR-FM-237

Seat No.	

Set S

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options 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

3) 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

4) 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) $P = \nabla.(\overline{E} \times \overline{H})$

5) Two media are characterized as _____.
   1) $\mu r = 1, \varepsilon r = 4$ and $\sigma = 0$ 2) $\mu r = 4, \varepsilon r = 4$ and $\sigma = 0$
   Where: εr = relative permittivity, μr = relative permeability and σ = conductivity
   The ratio of the intrinsic impedance of the media 2 to media 1 is _____.
   a) 2:1 b) 1:2
   c) 1:1 d) 2:2

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

8) If the direction of Coulomb's Force on a unit charge is $\overline{\mathrm{ax}}$, the direction of electric field intensity is _____.
   a) $\overline{\mathrm{ay}}$ b) $-\overline{\mathrm{ax}}$
   c) $\overline{\mathrm{az}}$ d) $\overline{\mathrm{ax}}$

9) If pair of $+ve$ & $-ve$ charges of 2C separated by distance $3\mu\mathrm{m}$ then the magnitude of dipole moment is _____.
   a) $2\ C-\ \mu m$ b) $1.5\ C-\ m$
   c) $6\ C-\ \mu m$ d) $3\ C-\ \mu m$

10) If E is a vector then $\nabla.\nabla\times E$ is _____.
   a) 1 b) 0
   c) ∞ d) doesn't exist

11) The unit of Electric field Intensity is _____.
   a) N/C b) V-m
   c) J-C/m d) All of these

12) If the voltage applied across the capacitor is increased, the capacitance value _____.
   a) increases b) Decreases
   c) remains constant d) becomes infinity

13) A quantitative relation between induced emf and rate of change of flux linkage is known as _____.
   a) Maxwell's law b) Stoke's law
   c) Lenz's law d) Faraday's law

14) What is the flux density of a magnetic field whose flux is 3000 $\mu\mathrm{Wb}$ and cross-sectional area is 0.25 m^2?
   a) 12,000 μT
   b) 83330 T
   c) 0 T
   d) insufficient information provided

SLR-FM-237

Seat No.	

Set S

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 56
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. **12**

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 $\bar{p} = 3\,\bar{a}x - 2\,\bar{a}y + \bar{a}z\,nC\text{-}m$. Find V at $P(2,3,4)$.

Q.3 Attempt any two. **16**

a) Find $\bar{E}$ 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^2 is placed at $y = 3$.

b) Derive the equation for $\bar{E}$ due to infinite sheet charge placed in z=0 plane.

c) Establish the boundary condition for dielectric boundary having permeability ε_1 and ε_2.

Section – II

Q.4 Attempt any three. **12**

a) State and explain Ampere's circuital law.

b) Write a note on antenna field zones.

c) In a medium if $\bar{E} = Em \sin \propto \cos(wt - \beta z)\,\bar{a}y\ V/m$ find $\bar{H}$.

d) If magnetic field intensity in a region is $\bar{H} = x^2\bar{a}x + 2yz\,\bar{a}y - x^2\bar{a}z$ find current density at point P(2,3,4).

Q.5 Attempt any two. **16**

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 $\bar{H} = \left(\frac{y^2 z}{x}\right)\bar{a}x + \left(0.5\,\frac{y^2 z^2}{x^2}\right)\bar{a}z$ 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.

SLR-FM-238

Seat No.	

Set P

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and 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 Marks: 14

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

1) Which of the following is not a unit of information?
   a) Bit b) Decit
   c) Nat d) Hz

2) The phase difference between two possible transmitted signals in BPSK is ___.
   a) Π b) $\Pi/2$
   c) $\Pi/4$ d) $\Pi/8$

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) $C<R^2$ d) $C>R^2$

4) Frequency shift keying is used mostly in _____.
   a) Radio transmission b) Telegraphy
   c) Telephony d) None of these

5) Companding is used in PCM to _____.
   a) Reduce bandwidth b) Reduce power
   c) Increase S/N ratio d) Get almost uniform S/N ratio

6) Duo binary signaling makes use of _____.
   a) Two binary b) A matched filter
   c) Controlled ISI introduction d) Correlation receiver

7) Equalizers are used for _____.
   a) Frame synchronization b) Symbol synchronization
   c) Carrier synchronization d) Minimizing ISI

8) Which of the following is more vulnerable to noise?
   a) Binary PSK b) Quadrature PSK
   c) 8-ary PSK d) 16-ary PSK

9) QAM has _____.
   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

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

Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 suitable data whenever necessary.

Section – I

Q.2 Answer any Four. **16**

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.

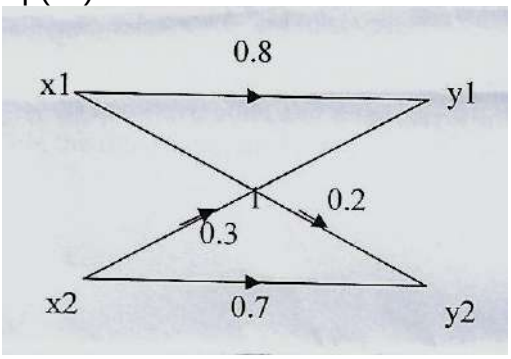
e) Explain the operation of a scrambler and un scrambler.

Q.3 Answer any Two. **12**

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



c) 1) Derive the expression of PCM bandwidth.
2) 24 telephone channels, each band limited to 3.4 KHz, are to be time division multiplexed by using PCM. Calculate the bandwidth of the PCM system for 128 quantization levels and an 8 KHz sampling frequency.

Section – II

Q.4 Attempt any four questions. **16**

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. **12**

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.

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

Determine.

1) All code words
2) Error detection and error correction capabilities.
3) Decode the received codeword [1 1 1 1 0 1 0]

Seat No.	

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 Max. Marks: 70
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 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?
   a) Binary PSK b) Quadrature PSK
   c) 8-ary PSK d) 16-ary PSK

2) QAM has _____.
   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

3) 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) $\frac{1}{2}erfc\frac{1}{2}\sqrt{\frac{E_b}{\eta_0}}$

4) 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

5) 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

6) 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

7) 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

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 is ___.
   a) Π
   b) $\Pi/2$
   c) $\Pi/4$
   d) $\Pi/8$

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 to _____.
   a) Reduce bandwidth
   b) Reduce power
   c) Increase S/N ratio
   d) 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

Seat No.	

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 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 suitable data whenever necessary.

Section – I

Q.2 Answer any Four. **16**

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.

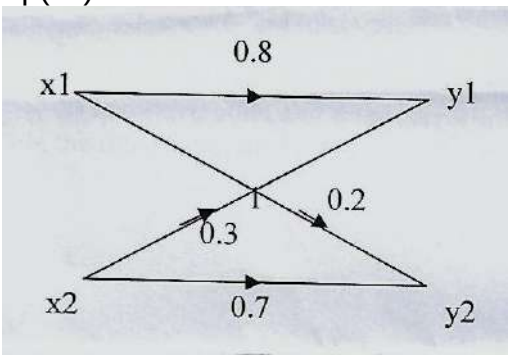
e) Explain the operation of a scrambler and un scrambler.

Q.3 Answer any Two. **12**

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



c) 1) Derive the expression of PCM bandwidth.
2) 24 telephone channels, each band limited to 3.4 KHz, are to be time division multiplexed by using PCM. Calculate the bandwidth of the PCM system for 128 quantization levels and an 8 KHz sampling frequency.

Section – II

Q.4 Attempt any four questions. **16**

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. **12**

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.

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

Determine.

1) All code words
2) Error detection and error correction capabilities.
3) Decode the received codeword [1 1 1 1 0 1 0]

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and 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 Marks: 14

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

1) Companding is used in PCM to _____.
   a) Reduce bandwidth b) Reduce power
   c) Increase S/N ratio d) Get almost uniform S/N ratio

2) Duo binary signaling makes use of _____.
   a) Two binary b) A matched filter
   c) Controlled ISI introduction d) Correlation receiver

3) Equalizers are used for _____.
   a) Frame synchronization b) Symbol synchronization
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4) Which of the following is more vulnerable to noise?
   a) Binary PSK b) Quadrature PSK
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5) QAM has _____.
   a) Variation of phase only with four values of phases
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   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) $\frac{1}{2}erfc\frac{1}{2}\sqrt{\frac{E_b}{\eta_0}}$

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
   c) Triangular pulse
   d) Sine function

8) Which of the following operations is not performed in a Multicarrier communication transmitter?
   a) Add Cyclic prefix
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   c) Fast Fourier Transform
   d) Autocorrelation

9) The minimum distance of a block code is defined as the _____.
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   b) the smallest hamming distance between any pair of code words
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11) Which of the following is not a unit of information?
   a) Bit
   b) Decit
   c) Nat
   d) Hz

12) The phase difference between two possible transmitted signals in BPSK is ___.
   a) Π
   b) $\Pi/2$
   c) $\Pi/4$
   d) $\Pi/8$

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
   b) C>R
   c) $C<R^2$
   d) $C>R^2$

14) Frequency shift keying is used mostly in _____.
   a) Radio transmission
   b) Telegraphy
   c) Telephony
   d) None of these

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 suitable data whenever necessary.

Section – I

Q.2 Answer any Four. **16**

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.

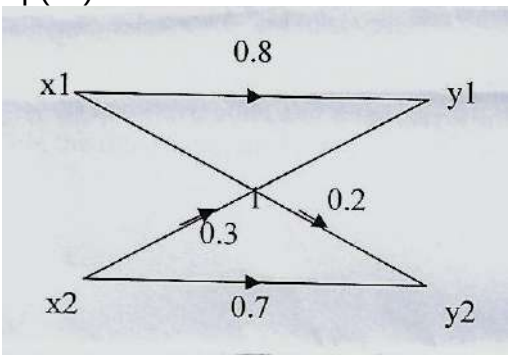
e) Explain the operation of a scrambler and un scrambler.

Q.3 Answer any Two. **12**

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



c) 1) Derive the expression of PCM bandwidth.
2) 24 telephone channels, each band limited to 3.4 KHz, are to be time division multiplexed by using PCM. Calculate the bandwidth of the PCM system for 128 quantization levels and an 8 KHz sampling frequency.

Section – II

Q.4 Attempt any four questions. **16**

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. **12**

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.

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

Determine.

1) All code words
2) Error detection and error correction capabilities.
3) Decode the received codeword [1 1 1 1 0 1 0]

Seat No.	

Set **S**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and 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 Marks: 14

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 _____.

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) $\frac{1}{2}erfc\frac{1}{2}\sqrt{\frac{E_b}{\eta_0}}$

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
b) Rectangular pulse of duration 2T
c) Triangular pulse
d) Sine function

3) 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

4) 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

5) 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

6) Which of the following is not a unit of information?
a) Bit b) Decit
c) Nat d) Hz

7) The phase difference between two possible transmitted signals in BPSK is ___.
   a) Π b) $\Pi/2$
   c) $\Pi/4$ d) $\Pi/8$

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<R b) C>R
   c) $C<R^2$ d) $C>R^2$

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 b) Reduce power
   c) Increase S/N ratio d) Get almost uniform S/N ratio

11) Duo binary signaling makes use of _____.
   a) Two binary b) A matched filter
   c) Controlled ISI introduction d) Correlation receiver

12) Equalizers are used for _____.
   a) Frame synchronization b) Symbol synchronization
   c) Carrier synchronization d) Minimizing ISI

13) Which of the following is more vulnerable to noise?
   a) Binary PSK b) Quadrature PSK
   c) 8-ary PSK d) 16-ary PSK

14) QAM has _____.
   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

Seat No.	

Set **S**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 suitable data whenever necessary.

Section – I

Q.2 Answer any Four. **16**

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.

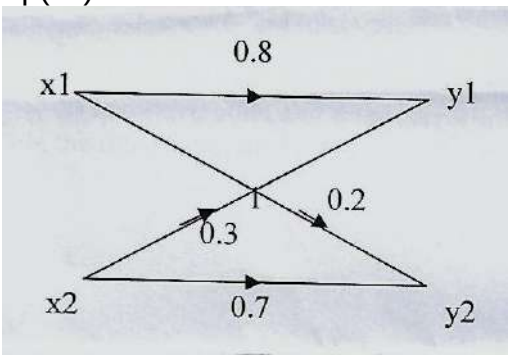
e) Explain the operation of a scrambler and un scrambler.

Q.3 Answer any Two. **12**

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



c) 1) Derive the expression of PCM bandwidth.
2) 24 telephone channels, each band limited to 3.4 KHz, are to be time division multiplexed by using PCM. Calculate the bandwidth of the PCM system for 128 quantization levels and an 8 KHz sampling frequency.

Section – II

Q.4 Attempt any four questions. **16**

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. **12**

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.

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

Determine.

1) All code words
2) Error detection and error correction capabilities.
3) Decode the received codeword [1 1 1 1 0 1 0]

SLR-FM-239

Seat No.	

Set P

T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) State-Transition diagram is _____.
   a) Stimulus-response model b) Data-flow model
   c) Architectural model d) Composition model

2) The goals of software testing leads to _____.
   a) Defect testing b) Violation testing
   c) Both 'a' and 'b' d) None

3) Release testing is also known as _____.
   a) Functional testing b) Regression testing
   c) Alfa testing d) None

4) Activity planning starts from _____.
   a) State 0 b) Selection of project
   c) Stage 1 d) Both a and b

5) Advantages of CBSE _____.
   a) Reduced software cost b) Faster delivery
   c) Reduced risk d) All

6) Which of the below is risk identification approach?
   a) Network analysis b) Forward tracking
   c) Checklist d) All

7) Testing helps us to _____ of product by finding defects in product.
   a) Fix defect b) Improve quality
   c) Measure quality d) All of the above

8) Organizing step is about _____.
   a) Group activities b) Distinguishing of activities
   c) Identifying of activities d) All

9) Functional requirement specification of a system should be _____.
   a) Complete b) Consistent
   c) Both a) and b) d) None of these

10) _____ provides a more striking visual indication of those activities that are not progressing to schedule.
   a) Slip chart b) Time line
   c) Gantt chart d) Ball chart

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

12) Risk exposure for each risk can be estimated as Risk Exposure = _____* probability of occurrence.
   a) Potential damage
   b) Cost of risk reduction
   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 network
   b) Cost monitoring
   c) Proposed plan
   d) None

Seat No.	

Set P

T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
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 Three. **12**

a) Explain test automation with testing workbench.
b) Write note on object aggregation.
c) Write in briefly the inheritance model.
d) List and explain characteristics of software process.

Q.3 Solve any Two. **16**

a) System requirement has IEEE standard. Explain standard suggestions for requirement document.
b) List system models and explain any one of them.
c) Explain release testing in detail.

Section – II

Q.4 Solve any Three. **12**

a) Explain categories of risk.
b) Describe forward pass for activity planning.
c) What is project? What are different activities of management?
d) Explain slip chart as tracking of project progress.

Q.5 Solve any Two. **16**

a) Write step wise project planning activates.
b) With suitable example explain Monte Carlo simulation and critical chain concepts.
c) What are different methods to visualize the progress of a project?

Seat No.	

Set **Q**

T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Organizing step is about _____.
   a) Group activities b) Distinguishing of activities
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   c) Proposed plan d) None

8) State-Transition diagram is _____.
   a) Stimulus-response model b) Data-flow model
   c) Architectural model d) Composition model

9) The goals of software testing leads to _____.
   a) Defect testing b) Violation testing
   c) Both ‘a’ and ‘b’ d) None

10) Release testing is also known as _____.
   a) Functional testing b) Regression testing
   c) Alfa testing d) None

11) Activity planning starts from _____.
   a) State 0 b) Selection of project
   c) Stage 1 d) Both a and b

12) Advantages of CBSE _____.
   a) Reduced software cost b) Faster delivery
   c) Reduced risk d) All

13) Which of the below is risk identification approach?
   a) Network analysis b) Forward tracking
   c) Checklist d) All

14) Testing helps us to _____ of product by finding defects in product.
   a) Fix defect b) Improve quality
   c) Measure quality d) All of the above

Seat No.	

Set **Q**

T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
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 Three. **12**

a) Explain test automation with testing workbench.
b) Write note on object aggregation.
c) Write in briefly the inheritance model.
d) List and explain characteristics of software process.

Q.3 Solve any Two. **16**

a) System requirement has IEEE standard. Explain standard suggestions for requirement document.
b) List system models and explain any one of them.
c) Explain release testing in detail.

Section – II

Q.4 Solve any Three. **12**

a) Explain categories of risk.
b) Describe forward pass for activity planning.
c) What is project? What are different activities of management?
d) Explain slip chart as tracking of project progress.

Q.5 Solve any Two. **16**

a) Write step wise project planning activates.
b) With suitable example explain Monte Carlo simulation and critical chain concepts.
c) What are different methods to visualize the progress of a project?

Seat No.	

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 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Advantages of CBSE _____.
   a) Reduced software cost b) Faster delivery
   c) Reduced risk d) All

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9) The Gantt chart is used for _____.
   a) Tracking project progress
   b) Knowing the activities
   c) Knowing starting date of project
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10) The base line budget is based on _____.
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   c) Proposed plan d) None

11) State-Transition diagram is _____.
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   a) State 0 b) Selection of project
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Seat No.	

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 Max. Marks: 56
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 Three. **12**

a) Explain test automation with testing workbench.
b) Write note on object aggregation.
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c) Explain release testing in detail.

Section – II

Q.4 Solve any Three. **12**

a) Explain categories of risk.
b) Describe forward pass for activity planning.
c) What is project? What are different activities of management?
d) Explain slip chart as tracking of project progress.

Q.5 Solve any Two. **16**

a) Write step wise project planning activates.
b) With suitable example explain Monte Carlo simulation and critical chain concepts.
c) What are different methods to visualize the progress of a project?

Seat No.	

Set **S**

T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) _____ provides a more striking visual indication of those activities that are not progressing to schedule.
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2) What are the different types of risk may occur when you develop software?
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14) Functional requirement specification of a system should be _____.
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Seat No.	

Set **S**

T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
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 Three. **12**

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b) Write note on object aggregation.
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d) List and explain characteristics of software process.

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a) System requirement has IEEE standard. Explain standard suggestions for requirement document.
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c) Explain release testing in detail.

Section – II

Q.4 Solve any Three. **12**

a) Explain categories of risk.
b) Describe forward pass for activity planning.
c) What is project? What are different activities of management?
d) Explain slip chart as tracking of project progress.

Q.5 Solve any Two. **16**

a) Write step wise project planning activates.
b) With suitable example explain Monte Carlo simulation and critical chain concepts.
c) What are different methods to visualize the progress of a project?

Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

1) The 4-point DFT of {1,1,0,0} _____.
   a) {2,0,2,0} b) {2,1+2j, -2, 1-2j}
   c) {0,4,0,0} d) {2,1-j,0,1+j}

2) FFT algorithm calculates _____.
   a) DTFT b) DCT
   c) DFT d) DST

3) If DFT of a sequence x(n) is X(k) then the DFT of $x(n)e^{-j2\pi \ln/2}$ 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

9) The frequency response of rectangular window is _____.

a) $\frac{\sin \omega N/2}{\sin \omega/2}$ b) $\frac{\sin \omega/2}{\sin \omega N/2}$

c) $\frac{\sin \omega N/2}{\omega/2}$ d) $\frac{\sin \omega N/2}{N\omega/2}$

10) The relation between Laplace transform and z-transform is _____.

a) $z = e^{st}$ b) $z = e^{jst}$

c) $s = e^{zt}$ d) $z = e^{-st}$

11) 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

12) The main lobe width of rectangular window is _____.

a) $\frac{\pi}{N}$ b) $\frac{2\pi}{N}$

c) $\frac{4\pi}{N}$ d) $\frac{8\pi}{N}$

13) 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

14) To meet the magnitude response specification for a transition width, one has to _____.

a) Select Proper Window b) To Select Kaiser Window

c) Select Filter Order d) Select Rectangular Window

Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) 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) Figures to the right indicate full marks.
3) Assume necessary data if necessary.

Section – I

Q.2 Attempt any Four. **16**

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. **12**

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. **16**

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.
$0.8 \leq |H(j\Omega)| \leq 1 \quad \text{for } 0 \leq \Omega \leq 0.2\pi$
$|H(j\Omega)| \leq 0.2 \quad \text{for } 0.6\pi \leq \Omega \leq \pi$
f) Compare Rectangular and Triangular windows.

Q.5 Attempt Any Two. **12**

a) Design an FIR Filter approximating the ideal frequency response.

$$Hd(e^{j\omega}) = e^{-j5w} \quad \text{for} \quad -\pi/2 \leq |\omega| \leq \pi/2$$

$$= 0 \quad \text{for} \quad \pi/2 < |\omega| \leq \pi$$

Using Blackman window with N-11

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

$$H(s) = \frac{1}{s^2 + \sqrt{2}s + 1}$$

c) Design a digital Butterworth filter satisfying the constraints.

$$0.707 \leq \left|H\left(e^{j\omega}\right)\right| \leq 1 \quad \text{for} \quad 0 \leq \omega \leq {}^{\pi}/_{2}$$

$$\left|H\left(e^{j\omega}\right)\right| \leq 0.2 \quad \text{for} \quad {}^{3\pi}/_{4} \leq \omega \leq \pi$$

with T=1 Sec using Bilinear Transformation

Seat No.	

Set **Q**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

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 frequency response of rectangular window is _____.
   a) $\frac{\sin \omega N/2}{\sin \omega/2}$ b) $\frac{\sin \omega/2}{\sin \omega N/2}$
   c) $\frac{\sin \omega N/2}{\omega/2}$ d) $\frac{\sin \omega N/2}{N\omega/2}$

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

7) To meet the magnitude response specification for a transition width, one has to _____.
   a) Select Proper Window
   b) To Select Kaiser Window
   c) Select Filter Order
   d) Select Rectangular Window

8) The 4-point DFT of {1,1,0,0} _____.
   a) {2,0,2,0}
   b) {2,1+2j, -2, 1-2j}
   c) {0,4,0,0}
   d) {2,1-j,0,1+j}

9) FFT algorithm calculates _____.
   a) DTFT
   b) DCT
   c) DFT
   d) DST

10) If DFT of a sequence x(n) is X(k) then the DFT of $x(n)e^{-j2\pi \ln/2}$ is _____.
   a) $X((k-l))_N$
   b) $X((k+l))_N$
   c) $e^{-j2\pi l}X(k)$
   d) $e^{j2\pi l}X(k)$

11) The DFT of the sequence $\mathrm{x}(n) = \delta(n-n_0)$ is _____.
   a) 1
   b) $e^{j2\pi k n_0}$
   c) $e^{-j2\pi k n_0/N}$
   d) $e^{j2\pi k n_0/N}$

12) 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

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

Seat No.	

Set Q

T.E. (Part – I) (New) (CBCS) 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) Figures to the right indicate full marks.
3) Assume necessary data if necessary.

Section – I

Q.2 Attempt any Four. **16**

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. **12**

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. **16**

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.
$0.8 \leq |H(j\Omega)| \leq 1 \quad \text{for } 0 \leq \Omega \leq 0.2\pi$
$|H(j\Omega)| \leq 0.2 \quad \text{for } 0.6\pi \leq \Omega \leq \pi$
f) Compare Rectangular and Triangular windows.

Q.5 Attempt Any Two. **12**

a) Design an FIR Filter approximating the ideal frequency response.

$$Hd(e^{j\omega}) = e^{-j5w} \quad \text{for} \quad -\pi/2 \leq \omega \leq \pi/2$$

$$= 0 \quad \text{for} \quad \pi/2 < |\omega| \leq \pi$$

Using Blackman window with N-11

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

$$H(s) = \frac{1}{s^2 + \sqrt{2}s + 1}$$

c) Design a digital Butterworth filter satisfying the constraints.

$$0.707 \leq \left|H\left(e^{j\omega}\right)\right| \leq 1 \quad \text{for} \quad 0 \leq \omega \leq {}^{\pi}/_{2}$$

$$\left|H\left(e^{j\omega}\right)\right| \leq 0.2 \quad \text{for} \quad {}^{3\pi}/_{4} \leq \omega \leq \pi$$

with T=1 Sec using Bilinear Transformation

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

1) 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

2) 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

3) Unwrapped phase response of FIR filter in pass band is _____.
   a) Exponentially increasing b) Exponentially decreasing
   c) Non-linear d) Linear

4) 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

5) The frequency response of rectangular window is _____.
   a) $\frac{\sin \omega N/2}{\sin \omega/2}$ b) $\frac{\sin \omega/2}{\sin \omega N/2}$
   c) $\frac{\sin \omega N/2}{\omega/2}$ d) $\frac{\sin \omega N/2}{N\omega/2}$

6) The relation between Laplace transform and z-transform is _____.
   a) $z = e^{st}$ b) $z = e^{jst}$
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7) The Impulse response of FIR system has a linear phase linear characteristics _____.

a) $\theta(\omega) = \alpha\omega$ b) $\theta(\omega) = -\frac{\partial\theta}{\partial\omega}$

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8) The main lobe width of rectangular window is _____.

a) $\frac{\pi}{N}$ b) $\frac{2\pi}{N}$

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10) To meet the magnitude response specification for a transition width, one has to _____.

a) Select Proper Window b) To Select Kaiser Window
c) Select Filter Order d) Select Rectangular Window

11) The 4-point DFT of {1,1,0,0} _____.

a) {2,0,2,0} b) {2,1+2j, -2, 1-2j}
c) {0,4,0,0} d) {2,1-j,0,1+j}

12) FFT algorithm calculates _____.

a) DTFT b) DCT
c) DFT d) DST

13) If DFT of a sequence x(n) is X(k) then the DFT of $x(n)e^{-j2\pi \ln/2}$ is _____.

a) $X((k-l))_N$ b) $X((k+l))_N$
c) $e^{-j2\pi l}X(k)$ d) $e^{j2\pi l}X(k)$

14) The DFT of the sequence $x(n) = \delta(n-n_0)$ is _____.

a) 1 b) $e^{j2\pi k n_0}$
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SLR-FM-240

Seat No.	

Set R

T.E. (Part – I) (New) (CBCS) 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) Figures to the right indicate full marks.
3) Assume necessary data if necessary.

Section – I

Q.2 Attempt any Four. **16**

a) Explain the sampling in frequency domain.
b) Compute the Auto correlation of given sequence $x(n) = \{1,3,3,4,5\}$.
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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. **12**

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?
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Section – II

Q.4 Attempt Any Four. **16**

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?
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f) Compare Rectangular and Triangular windows.

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a) Design an FIR Filter approximating the ideal frequency response.

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$$= 0 \quad \text{for} \quad \pi/2 < |\omega| \leq \pi$$

Using Blackman window with N-11

b) Using Impulse invariance with T=1 Sec determine H(Z) if.

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with T=1 Sec using Bilinear Transformation

Seat No.		Set	S

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

1) The relation between Laplace transform and z-transform is _____.
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5) To meet the magnitude response specification for a transition width, one has to _____.
   a) Select Proper Window b) To Select Kaiser Window
   c) Select Filter Order d) Select Rectangular Window

6) The 4-point DFT of {1,1,0,0} _____.
   a) {2,0,2,0} b) {2,1+2j, -2, 1-2j}
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Seat No.		Set	S

T.E. (Part – I) (New) (CBCS) 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) Figures to the right indicate full marks.
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Section – I

Q.2 Attempt any Four. **16**

a) Explain the sampling in frequency domain.
b) Compute the Auto correlation of given sequence $x(n) = \{1,3,3,4,5\}$.
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$x_1(n) = \{1,3,2,5,4\}$
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Q.3 Attempt any two. **12**

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. **16**

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?
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Using Blackman window with N-11

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with T=1 Sec using Bilinear Transformation

Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Serial port interrupt is generated, if _____ bits are set.
   a) IE b) RI, IE
   c) IP, TI d) RI, TI

2) 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

3) 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

4) 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

5) In 8051 which interrupt has highest priority?
   a) IE1 b) TF0
   c) IE0 d) TF1

6) The bit address range for the byte address 25H is _____.
   a) 00-07H b) 28-2Fh
   c) 20-27H d) 30-37H

7) 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

8) To address a memory location out of N memory locations, the number of 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) d) log (2N) (to the base e)

9) 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
   b) Port 1 & Port 2 respectively
   c) Port 0 & Port 2 respectively
   d) Port 2 & Port 3 respectively

10) How does the microcontroller communicate with the external peripherals/memory?
   a) via I/O ports
   b) via register arrays
   c) via memory
   d) all of the above

11) How many data lines are essential in addition to RS, EN and RW control lines for interfacing LCD with Atmel 89C51 microcontroller?
   a) 3
   b) 5
   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?
   a) ALE
   b) PSEN
   c) RD and WR
   d) All of the above

13) 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.
   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
   b) 900 times
   c) 690 times
   d) 960 times

Seat No.	

Set **P**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 56
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. **16**

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 **12**

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. **16**

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 **12**

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.

Seat No.	

Set **Q**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) To address a memory location out of N memory locations, the number of 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) d) log (2N) (to the base e)

2) 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 b) Port 1 & Port 2 respectively
   c) Port 0 & Port 2 respectively d) Port 2 & Port 3 respectively

3) How does the microcontroller communicate with the external peripherals/memory?
   a) via I/O ports b) via register arrays
   c) via memory d) all of the above

4) How many data lines are essential in addition to RS, EN and RW control lines for interfacing LCD with Atmel 89C51 microcontroller?
   a) 3 b) 5
   c) 8 d) 10

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 timings?
   a) ALE b) PSEN
   c) RD and WR d) All of the above

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.
   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

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

8) Serial port interrupt is generated, if _____ bits are set.
a) IE
b) RI, IE
c) IP, TI
d) RI, TI

9) 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

10) 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

11) 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

12) In 8051 which interrupt has highest priority?
a) IE1
b) TF0
c) IE0
d) TF1

13) The bit address range for the byte address 25H is _____.
a) 00-07H
b) 28-2Fh
c) 20-27H
d) 30-37H

14) 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

Seat No.	

Set **Q**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 56
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. **16**

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 **12**

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. **16**

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 **12**

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.

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) In 8051 which interrupt has highest priority?
   a) IE1 b) TF0
   c) IE0 d) TF1

2) The bit address range for the byte address 25H is _____.
   a) 00-07H b) 28-2Fh
   c) 20-27H d) 30-37H

3) 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

4) To address a memory location out of N memory locations, the number of address lines required is _____.
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   c) log N (to the base e) d) log (2N) (to the base e)

5) 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 b) Port 1 & Port 2 respectively
   c) Port 0 & Port 2 respectively d) Port 2 & Port 3 respectively

6) How does the microcontroller communicate with the external peripherals/memory?
   a) via I/O ports b) via register arrays
   c) via memory d) all of the above

7) How many data lines are essential in addition to RS, EN and RW control lines for interfacing LCD with Atmel 89C51 microcontroller?
   a) 3 b) 5
   c) 8 d) 10

8) 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 b) PSEN
   c) RD and WR d) All of the above

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.
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AGAIN: CPL A

DJNZ R6, AGAIN
DJNZ R1, NEXT
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   a) 600 times
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11) Serial port interrupt is generated, if _____ bits are set.
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14) 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

Seat No.	

Set **R**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 56
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. **16**

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 **12**

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. **16**

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.
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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.

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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.

Seat No.	

Set **S**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) How does the microcontroller communicate with the external peripherals/memory?
   a) via I/O ports b) via register arrays
   c) via memory d) all of the above

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 b) 5
   c) 8 d) 10

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 b) PSEN
   c) RD and WR d) All of the above

4) Which of the following statements is true?
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NEXT: MOV R6, #10H
AGAIN: CPL A

DJNZ R6, AGAIN
DJNZ R1, NEXT
```

a) 600 times
b) 900 times
c) 690 times
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6) Serial port interrupt is generated, if _____ bits are set.
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b) RI, IE
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7) SP of 8051 is of _____ wide and it is loaded with the default value of _____ after reset.
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9) Which of the following instruction perform the move accumulator to external RAM of 16bit address?
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b) log N (to the base 10)
c) log N (to the base e)
d) log (2N) (to the base e)

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
b) Port 1 & Port 2 respectively
c) Port 0 & Port 2 respectively
d) Port 2 & Port 3 respectively

Seat No.	

Set **S**

T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER – I

Day & Date: Monday,16-12-2019 Max. Marks: 56
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. **16**

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 **12**

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. **16**

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 **12**

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.

Seat No.	

Set **P**

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

Duration: 30 Minutes Marks: 14

Q.1 Attempt all questions. **14**

1) H-plane Tee is called _____.
   a) Current divider b) Power device
   c) 3 dB splitter d) Reciprocal device

2) 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

3) In case of Matched load _____.
   a) Transmission is zero
   b) Reflection is zero
   c) Reflection is unity
   d) Transmission is equal to reflection

4) PIN diode is _____ type solid state device.
   a) Controllable impedance b) Negative resistance
   c) Non-linear reactance d) Non-linear resistance

5) The Two -valley model is best suited to explain the working of _____.
   a) IMPATT diode b) TRAPATT diode
   c) Gunn diode d) PIN diode

6) The dominant mode in rectangular waveguide is _____.
   a) TE10 b) TE11
   c) TE01 d) TE12

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) $244.94\ \Omega$ b) $376.7\ \Omega$
   c) $173.20\ \Omega$ d) None of these

8) An accelerating dc voltage of 10 kV will result in an electron velocity of _____ m/sec.
   a) 5.93×10^6 b) 59.3×10^6
   c) 0.593×10^6 d) 5.93×10^8

9) In case of Magnetron frequency pulling takes place due to ____ variations.
   a) Supply b) Load
   c) Frequency d) Amplitude

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 radar
   b) Modulated CW radar
   c) Unmodulated CW radar
   d) None of these

12) The power in the range of kilo Watts can be measured by _____ technique.
   a) Balometer
   b) Thermister
   c) Calorimetric
   d) Calorimetric wattmeter

13) The average power depends on the transmitter power Pt and the duty cycle given by _____.
   a) $\mathrm{Pavg} = \mathrm{Pt}^{*}$duty cycle
   b) $\mathrm{Pavg} = \mathrm{Pt}^{*}$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
   b) RF substitution
   c) using magic Tee
   d) Using slotted line

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

a) Explain working of two hole Directional Coupler.

b) A lossless 100 Ω transmission line terminated in 200 + j 200 Ω.
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 x 10^7 cm/s, L = 6 μm, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

Q.3 Attempt any Two. **16**

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. **12**

a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 ¾ 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.

Q.5 Attempt any Two. **16**

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.

Seat No.	

Set **Q**

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

Duration: 30 Minutes Marks: 14

Q.1 Attempt all questions. **14**

1) An accelerating dc voltage of 10 kV will result in an electron velocity of _____ m/sec.
   a) 5.93×10^6 b) 59.3×10^6
   c) 0.593×10^6 d) 5.93×10^8

2) In case of Magnetron frequency pulling takes place due to ____ variations.
   a) Supply b) Load
   c) Frequency d) Amplitude

3) 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

4) _____ type radar cannot determine range of the moving target.
   a) Pulsed radar b) Modulated CW radar
   c) Unmodulated CW radar d) None of these

5) The power in the range of kilo Watts can be measured by _____ technique.
   a) Balometer b) Thermister
   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 b) $Pavg = Pt^*$pulse width*prf
   c) both of the above d) None of these

7) Accurate Measurement of attenuation can be done by _____ method.
   a) Power Ratio b) RF substitution
   c) using magic Tee d) Using slotted line

8) H-plane Tee is called _____.
   a) Current divider b) Power device
   c) 3 dB splitter d) Reciprocal device

9) 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

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
   c) 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 $L = 0.6\ \mu\text{H}$, $\text{C} = 10\ \text{pF/m}$. Characteristic impedance of this transmission line is _____.
   a) $244.94\ \Omega$
   b) $376.7\ \Omega$
   c) $173.20\ \Omega$
   d) None of these

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

a) Explain working of two hole Directional Coupler.

b) A lossless 100 Ω transmission line terminated in 200 + j 200 Ω.
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 x 10^7 cm/s, L = 6 μm, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

Q.3 Attempt any Two. **16**

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. **12**

a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 ¾ 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.

Q.5 Attempt any Two. **16**

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.

Seat No.	

Set **R**

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

Duration: 30 Minutes Marks: 14

Q.1 Attempt all questions. **14**

1) The Two -valley model is best suited to explain the working of _____.
   a) IMPATT diode b) TRAPATT diode
   c) Gunn diode d) PIN diode

2) The dominant mode in rectangular waveguide is _____.
   a) TE10 b) TE11
   c) TE01 d) TE12

3) A lossless Transmission line operating at 200 M rad/sec has $L = 0.6\ \mu\text{H}$, $\text{C} = 10\ \text{pF/m}$. Characteristic impedance of this transmission line is _____.
   a) $244.94\ \Omega$ b) $376.7\ \Omega$
   c) $173.20\ \Omega$ d) None of these

4) An accelerating dc voltage of 10 kV will result in an electron velocity of _____ m/sec.
   a) 5.93 X 10^6 b) 59.3 X 10^6
   c) 0.593 X 10^6 d) 5.93 X 10^8

5) In case of Magnetron frequency pulling takes place due to ____ variations.
   a) Supply b) Load
   c) Frequency d) Amplitude

6) 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

7) _____ type radar cannot determine range of the moving target.
   a) Pulsed radar b) Modulated CW radar
   c) Unmodulated CW radar d) None of these

8) The power in the range of kilo Watts can be measured by _____ technique.
   a) Balometer b) Thermister
   c) Calorimetric d) Calorimetric wattmeter

9) The average power depends on the transmitter power Pt and the duty cycle given by _____.
   a) $\text{Pavg} = \text{Pt}^*$duty cycle b) $\text{Pavg} = \text{Pt}^*$pulse width*prf
   c) both of the above d) None of these

10) Accurate Measurement of attenuation can be done by _____ method.
   a) Power Ratio
   b) RF substitution
   c) using magic Tee
   d) Using slotted line

11) H-plane Tee is called _____.
   a) Current divider
   b) Power device
   c) 3 dB splitter
   d) 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.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

a) Explain working of two hole Directional Coupler.

b) A lossless 100 Ω transmission line terminated in 200 + j 200 Ω.
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 x 10^7 cm/s, L = 6 μm, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

Q.3 Attempt any Two. **16**

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. **12**

a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 ¾ 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.

Q.5 Attempt any Two. **16**

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.

Seat No.	

Set **S**

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

Duration: 30 Minutes Marks: 14

Q.1 Attempt all questions. **14**

1) 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

2) _____ type radar cannot determine range of the moving target.
   a) Pulsed radar b) Modulated CW radar
   c) Unmodulated CW radar d) None of these

3) The power in the range of kilo Watts can be measured by _____ technique.
   a) Balometer b) Thermister
   c) Calorimetric d) Calorimetric wattmeter

4) 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

5) Accurate Measurement of attenuation can be done by _____ method.
   a) Power Ratio b) RF substitution
   c) using magic Tee d) Using slotted line

6) H-plane Tee is called _____.
   a) Current divider b) Power device
   c) 3 dB splitter d) Reciprocal device

7) 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

8) In case of Matched load _____.
   a) Transmission is zero
   b) Reflection is zero
   c) Reflection is unity
   d) Transmission is equal to reflection

9) PIN diode is _____ type solid state device.
   a) Controllable impedance
   b) Negative resistance
   c) Non-linear reactance
   d) Non-linear resistance

10) The Two -valley model is best suited to explain the working of _____.
   a) IMPATT diode
   b) TRAPATT diode
   c) Gunn diode
   d) PIN diode

11) The dominant mode in rectangular waveguide is _____.
   a) TE10
   b) TE11
   c) TE01
   d) TE12

12) A lossless Transmission line operating at 200 M rad/sec has $L = 0.6\ \mu\text{H}$, $\text{C} = 10\ \text{pF/m}$. Characteristic impedance of this transmission line is _____.
   a) $244.94\ \Omega$
   b) $376.7\ \Omega$
   c) $173.20\ \Omega$
   d) None of these

13) An accelerating dc voltage of 10 kV will result in an electron velocity of _____ m/sec.
   a) 5.93×10^6
   b) 59.3×10^6
   c) 0.593×10^6
   d) 5.93×10^8

14) In case of Magnetron frequency pulling takes place due to ____ variations.
   a) Supply
   b) Load
   c) Frequency
   d) Amplitude

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

a) Explain working of two hole Directional Coupler.

b) A lossless 100 Ω transmission line terminated in 200 + j 200 Ω.
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 x 10^7 cm/s, L = 6 μm, V0 = 100 V, I0 = 200mA. Find maximum continuous wave output power and frequency of operation if efficiency is 15%.

Q.3 Attempt any Two. **16**

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. **12**

a) Reflex Klystron operated at 56 Hz with anode voltage 1000 V and cavity gap 2mm. Calculate gap trasit angle. Assume 1 ¾ 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.

Q.5 Attempt any Two. **16**

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.

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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

1) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON b) INDF
   c) PCL d) STATUS

2) Special Purpose Registers of PIC 16F877 are mapped into data space at _____.
   a) 00H - 1FH b) 80H - 9FH
   c) both a & b d) None of these

3) The SLEEP instructions makes the PIC 16F877 _____.
   a) Reset b) Standby mode
   c) Power down mode d) none of these

4) The Vref for ADC in PIC 16F877 is selected by _____ register.
   a) ADCON0 b) ADCON1
   c) ADRES d) PIR1

5) The CALL and GOTO instructions provides _____ bit address to allow branching within any _____ program memory space
   a) 11, 2K b) 13, 8K
   c) 16, 64K d) None of these

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

8) 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

9) 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

10) 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

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

12) 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

13) 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

14) 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

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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) Attempt any two of the following questions. **10**
1) Explain the memory organization of PIC16F877.
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.

B) Explain the following instructions **04**
1) clrwdt
2) incfsz

Q.3 Attempt any two of the following questions. **14**
a) With neat block diagram explain PWM mode. How to vary PWM period and duty cycle?
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) Attempt any two of the following questions. **10**
a) Explain how SPI bus can be used for I/O expansion.
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.
c) Explain I^2C Bus and how to use it?

B) Explain the features of PIC18. **04**

Q.5 Attempt any two of the following questions. **14**
a) Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.
b) How to initialize USART for transmission of data in Asynchronous mode. Explain the registers associated with it.
c) Explain any one automation and control application based on PIC.

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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

1) 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

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

5) 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

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

7) 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

8) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON
   b) INDF
   c) PCL
   d) STATUS

9) Special Purpose Registers of PIC 16F877 are mapped into data space at _____.
   a) 00H - 1FH
   b) 80H - 9FH
   c) both a & b
   d) None of these

10) The SLEEP instructions makes the PIC 16F877 _____.
   a) Reset
   b) Standby mode
   c) Power down mode
   d) none of these

11) The Vref for ADC in PIC 16F877 is selected by _____ register.
   a) ADCON0
   b) ADCON1
   c) ADRES
   d) PIR1

12) The CALL and GOTO instructions provides _____ bit address to allow branching within any _____ program memory space
   a) 11, 2K
   b) 13, 8K
   c) 16, 64K
   d) None of these

13) 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

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

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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) Attempt any two of the following questions. **10**
1) Explain the memory organization of PIC16F877.
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.

B) Explain the following instructions **04**
1) clrwdt
2) incfsz

Q.3 Attempt any two of the following questions. **14**
a) With neat block diagram explain PWM mode. How to vary PWM period and duty cycle?
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) Attempt any two of the following questions. **10**
a) Explain how SPI bus can be used for I/O expansion.
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.
c) Explain I^2C Bus and how to use it?

B) Explain the features of PIC18. **04**

Q.5 Attempt any two of the following questions. **14**
a) Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.
b) How to initialize USART for transmission of data in Asynchronous mode. Explain the registers associated with it.
c) Explain any one automation and control application based on PIC.

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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

1) The CALL and GOTO instructions provides _____ bit address to allow branching within any _____ program memory space
   a) 11, 2K b) 13, 8K
   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
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4) 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

5) 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

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
   c) 0.4 μs d) 0.8 μs

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 b) 80H - 9FH
   c) both a & b d) 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 b) ADCON1
   c) ADRES d) PIR1

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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) Attempt any two of the following questions. **10**
1) Explain the memory organization of PIC16F877.
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.

B) Explain the following instructions **04**
1) Clrwdt
2) Incfsz

Q.3 Attempt any two of the following questions. **14**
a) With neat block diagram explain PWM mode. How to vary PWM period and duty cycle?
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) Attempt any two of the following questions. **10**
a) Explain how SPI bus can be used for I/O expansion.
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.
c) Explain I^2C Bus and how to use it?

B) Explain the features of PIC18. **04**

Q.5 Attempt any two of the following questions. **14**
a) Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.
b) How to initialize USART for transmission of data in Asynchronous mode. Explain the registers associated with it.
c) Explain any one automation and control application based on PIC.

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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

1) 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

2) 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

3) 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

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
   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

5) 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

6) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON b) INDF
   c) PCL d) STATUS

7) Special Purpose Registers of PIC 16F877 are mapped into data space at _____.
   a) 00H - 1FH b) 80H - 9FH
   c) both a & b d) None of these

8) The SLEEP instructions makes the PIC 16F877 _____.
   a) Reset
   b) Standby mode
   c) Power down mode
   d) none of these

9) The Vref for ADC in PIC 16F877 is selected by _____ register.
   a) ADCON0
   b) ADCON1
   c) ADRES
   d) PIR1

10) The CALL and GOTO instructions provides _____ bit address to allow branching within any _____ program memory space
   a) 11, 2K
   b) 13, 8K
   c) 16, 64K
   d) None of these

11) 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

12) 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

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.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLER - II (PIC)

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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) Attempt any two of the following questions. **10**
1) Explain the memory organization of PIC16F877.
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.

B) Explain the following instructions **04**
1) clrwdt
2) incfsz

Q.3 Attempt any two of the following questions. **14**
a) With neat block diagram explain PWM mode. How to vary PWM period and duty cycle?
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) Attempt any two of the following questions. **10**
a) Explain how SPI bus can be used for I/O expansion.
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.
c) Explain I^2C Bus and how to use it?

B) Explain the features of PIC18. **04**

Q.5 Attempt any two of the following questions. **14**
a) Interface 16x2 LCD to PIC 16F877 and write assembly language program to display INDIA on second line of LCD.
b) How to initialize USART for transmission of data in Asynchronous mode. Explain the registers associated with it.
c) Explain any one automation and control application based on PIC.

SLR-FM-244

Seat No.	

Set P

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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

1) 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

2) For SCR, holding current is _____ than latching current.
   a) Greater b) Less
   c) equal d) both (a) and (c)

3) 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

4) 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
   c) Negative, Positive d) Negative, Negative

5) Single phase fully controlled rectifier with inductive load is operated from 230 V, 50 Hz AC input & firing angle is 30^{o}. Frequency of ripple in the output is _____ Hz.
   a) 50 b) 100
   c) 150 d) 200

6) For Class A commutation series R-L-C circuit in series with SCR is _____.
   a) Under damped b) Over damped
   c) Critically damped d) none

7) IC 1596 is _____.
   a) $3_{1/2}$ digit DVM b) Balanced modulator
   c) PLL d) Timer

8) The time period of IC 2240 is given as _____.
   a) T = RC b) T = 0.67 RC
   c) T = 0.7 RC d) None of the above

9) The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz resolution is _____.
   a) 4 b) 2
   c) 7 d) 8

10) When trigger and reset both are applied simultaneously to IC 2240 then?
   a) Trigger gets activated b) Reset gets activated
   c) Both a and b d) None

11) The IC XR 2240 consist of _____.
   a) 8 bit Counter b) 4 bit Counter
   c) 8 digit Counter d) 4 digit Counter

12) Which of the following temperature sensor has sensitivity 10 mv/° c
   a) LM 35 b) J-type thermocouple
   c) PT 100 d) None

13) Which of following is self powered temperature sensor?
   a) Thermocouple b) RTD
   c) Thermistor d) None of these

14) For input voltage range 0 - 2V, t2= 2000, required DVM display is.
   a) 2 digit b) 3 digit
   c) 3 ½ digit d) 3 ¾ digit

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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.
d) Explain the basic principle of working of balanced modulator with waveform.

Q.3 Answer any one of the following question. **08**

a) Draw construction and VI characteristics of SCR and explain its working.
b) Draw and explain single phase controlled rectifier with center tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

Q.4 Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz using PLL 565. **08**

Section – II

Q.5 Answer any three of the following question. **12**

a) Design a timer using XR 2240 to generate a delay of 300 seconds.
b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA.
c) Draw and explain architecture of PLC.
Compare between ON – OFF controller and proportional controller.

Q.6 Answer any one of the following question. **08**

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 ^{0} C. set point is 60 ^{0} C and required full scale output is 10 V.

Q.7 Answer any one of the following question. **08**

a) Design 3 ½ digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
b) Draw and explain ladder diagram for bottle filling plant system.

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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

1) The time period of IC 2240 is given as _____.
   a) T = RC b) T = 0.67 RC
   c) T = 0.7 RC d) None of the above

2) The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz resolution is _____.
   a) 4 b) 2
   c) 7 d) 8

3) When trigger and reset both are applied simultaneously to IC 2240 then?
   a) Trigger gets activated b) Reset gets activated
   c) Both a and b d) None

4) The IC XR 2240 consist of _____.
   a) 8 bit Counter b) 4 bit Counter
   c) 8 digit Counter d) 4 digit Counter

5) Which of the following temperature sensor has sensitivity 10 mv/° c
   a) LM 35 b) J-type thermocouple
   c) PT 100 d) None

6) Which of following is self powered temperature sensor?
   a) Thermocouple b) RTD
   c) Thermistor d) None of these

7) For input voltage range 0 - 2V, t2= 2000, required DVM display is.
   a) 2 digit b) 3 digit
   c) 3 ½ digit d) 3 ¾ digit

8) 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

9) For SCR, holding current is _____ than latching current.
   a) Greater b) Less
   c) equal d) both (a) and (c)

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
   c) Negative, Positive
   d) Negative, Negative

12) Single phase fully controlled rectifier with inductive load is operated from 230 V, 50 Hz AC input & firing angle is 30^{o}. Frequency of ripple in the output is _____ Hz.
   a) 50
   b) 100
   c) 150
   d) 200

13) For Class A commutation series R-L-C circuit in series with SCR is _____.
   a) Under damped
   b) Over damped
   c) Critically damped
   d) none

14) IC 1596 is _____.
   a) $3_{1/2}$ digit DVM
   b) Balanced modulator
   c) PLL
   d) Timer

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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.
d) Explain the basic principle of working of balanced modulator with waveform.

Q.3 Answer any one of the following question. **08**

a) Draw construction and VI characteristics of SCR and explain its working.
b) Draw and explain single phase controlled rectifier with center tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

Q.4 Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz using PLL 565. **08**

Section – II

Q.5 Answer any three of the following question. **12**

a) Design a timer using XR 2240 to generate a delay of 300 seconds.
b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA.
c) Draw and explain architecture of PLC.
Compare between ON – OFF controller and proportional controller.

Q.6 Answer any one of the following question. **08**

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 ^{0} C. set point is 60 ^{0} C and required full scale output is 10 V.

Q.7 Answer any one of the following question. **08**

a) Design 3 ½ digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
b) Draw and explain ladder diagram for bottle filling plant system.

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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

1) Single phase fully controlled rectifier with inductive load is operated from 230 V, 50 Hz AC input & firing angle is 30^{o}. Frequency of ripple in the output is _____ Hz.
   a) 50 b) 100
   c) 150 d) 200

2) For Class A commutation series R-L-C circuit in series with SCR is _____.
   a) Under damped b) Over damped
   c) Critically damped d) none

3) IC 1596 is _____.
   a) $3_{1/2}$ digit DVM b) Balanced modulator
   c) PLL d) Timer

4) The time period of IC 2240 is given as _____.
   a) T = RC b) T = 0.67 RC
   c) T = 0.7 RC d) None of the above

5) The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz resolution is _____.
   a) 4 b) 2
   c) 7 d) 8

6) When trigger and reset both are applied simultaneously to IC 2240 then?
   a) Trigger gets activated b) Reset gets activated
   c) Both a and b d) None

7) The IC XR 2240 consist of _____.
   a) 8 bit Counter b) 4 bit Counter
   c) 8 digit Counter d) 4 digit Counter

8) Which of the following temperature sensor has sensitivity 10 mv/° c
   a) LM 35 b) J-type thermocouple
   c) PT 100 d) None

9) Which of following is self powered temperature sensor?
   a) Thermocouple b) RTD
   c) Thermistor d) None of these

10) For input voltage range 0 - 2V, t2= 2000, required DVM display is.
   a) 2 digit
   b) 3 digit
   c) 3 ½ digit
   d) 3 ¾ 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.
   a) 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
   b) Positive, Positive
   c) Negative, Positive
   d) Negative, Negative

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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.
d) Explain the basic principle of working of balanced modulator with waveform.

Q.3 Answer any one of the following question. **08**

a) Draw construction and VI characteristics of SCR and explain its working.
b) Draw and explain single phase controlled rectifier with center tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

Q.4 Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz using PLL 565. **08**

Section – II

Q.5 Answer any three of the following question. **12**

a) Design a timer using XR 2240 to generate a delay of 300 seconds.
b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA.
c) Draw and explain architecture of PLC.
Compare between ON – OFF controller and proportional controller.

Q.6 Answer any one of the following question. **08**

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 ^{0} C. set point is 60 ^{0} C and required full scale output is 10 V.

Q.7 Answer any one of the following question. **08**

a) Design 3 ½ digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
b) Draw and explain ladder diagram for bottle filling plant system.

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 70
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

1) When trigger and reset both are applied simultaneously to IC 2240 then?
   a) Trigger gets activated b) Reset gets activated
   c) Both a and b d) None

2) The IC XR 2240 consist of _____.
   a) 8 bit Counter b) 4 bit Counter
   c) 8 digit Counter d) 4 digit Counter

3) Which of the following temperature sensor has sensitivity 10 mv/° c
   a) LM 35 b) J-type thermocouple
   c) PT 100 d) None

4) Which of following is self powered temperature sensor?
   a) Thermocouple b) RTD
   c) Thermistor d) None of these

5) For input voltage range 0 - 2V, t2= 2000, required DVM display is.
   a) 2 digit b) 3 digit
   c) 3 ½ digit d) 3 ¾ digit

6) 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

7) For SCR, holding current is _____ than latching current.
   a) Greater b) Less
   c) equal d) both (a) and (c)

8) 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

9) 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
   c) Negative, Positive
   d) Negative, Negative

10) Single phase fully controlled rectifier with inductive load is operated from 230 V, 50 Hz AC input & firing angle is 30^{o}. Frequency of ripple in the output is _____ Hz.
   a) 50
   b) 100
   c) 150
   d) 200

11) For Class A commutation series R-L-C circuit in series with SCR is _____.
   a) Under damped
   b) Over damped
   c) Critically damped
   d) none

12) IC 1596 is _____.
   a) $3_{1/2}$ digit DVM
   b) Balanced modulator
   c) PLL
   d) Timer

13) The time period of IC 2240 is given as _____.
   a) T = RC
   b) T = 0.67 RC
   c) T = 0.7 RC
   d) None of the above

14) The number of IC 74926 required to count frequency of 1 MHz with 0.1 Hz resolution is _____.
   a) 4
   b) 2
   c) 7
   d) 8

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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.
d) Explain the basic principle of working of balanced modulator with waveform.

Q.3 Answer any one of the following question. **08**

a) Draw construction and VI characteristics of SCR and explain its working.
b) Draw and explain single phase controlled rectifier with center tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

Q.4 Design frequency synthesizer to generate a frequency of 0.1 KHz to 999.9 KHz using PLL 565. **08**

Section – II

Q.5 Answer any three of the following question. **12**

a) Design a timer using XR 2240 to generate a delay of 300 seconds.
b) Design voltage to current converter to convert 0 to 5 V into 4 to 20 mA.
c) Draw and explain architecture of PLC.
Compare between ON – OFF controller and proportional controller.

Q.6 Answer any one of the following question. **08**

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 ^{0} C. set point is 60 ^{0} C and required full scale output is 10 V.

Q.7 Answer any one of the following question. **08**

a) Design 3 ½ digit DVM for measurement of Vin= ± 2V. Use 1 MHz clock.
b) Draw and explain ladder diagram for bottle filling plant system.

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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**

1) 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) Structure b) Acceptance angle
   c) Refractive index profile d) 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 _____.
   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 b) Decrease in temp
   c) Increase in pressure d) None of these

5) Laser is _____ optical source
   a) Non-coherent b) 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

7) 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

9) A photodiode has a quantum efficiency of 70% when photos of energy $1.8x10^{-19}$ are incident upon it, then the responsivity of the photodiode is _____.

a) 0.694 b) 0.723
c) 0.369 d) 0.623

10) Wavelength division multiplexing is same as _____.

a) FDM b) TDM
c) DWDM d) None

11) In optical communication system, the light detector is: _____.

a) Avalanche Photo Diode (APD)
b) Positive Intrinsic Negative (PIN) diode
c) Phototransistor
d) Either a or b

12) Impact Ionization phenomenon occur in _____.

a) p-n photodiode b) avalanche photodiode
c) p-i-n photodiode d) none of these

13) The basic performance of WDM is determined by _____.

a) Insertion loss b) Transmission loss
c) Noise added in channel d) All of the Above

14) The electron hole pairs generated in a photodiode are separated by the _____.

a) Magnetic field b) Electric field
c) Static field d) Depletion region

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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^{-1}. 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 μW 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. **16**

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.

Section – II

Q.4 Answer any three **12**

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 μm. When the incident optical power is 0.5 μW, the output current from the device (after avalanche gain) is 11 μA. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

Q.5 Answer any two. **16**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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**

1) The requirement of detector is _____.
   a) High fidelity b) Larger size
   c) More numerical aperture d) All of above

2) A photodiode has a quantum efficiency of 70% when photos of energy $1.8x10^{-19}$ are incident upon it, then the responsivity of the photodiode is _____.
   a) 0.694 b) 0.723
   c) 0.369 d) 0.623

3) Wavelength division multiplexing is same as _____.
   a) FDM b) TDM
   c) DWDM d) None

4) In optical communication system, the light detector is: _____.
   a) Avalanche Photo Diode (APD)
   b) Positive Intrinsic Negative (PIN) diode
   c) Phototransistor
   d) Either a or b

5) Impact Ionization phenomenon occur in _____.
   a) p-n photodiode b) avalanche photodiode
   c) p-i-n photodiode d) none of these

6) The basic performance of WDM is determined by _____.
   a) Insertion loss b) Transmission loss
   c) Noise added in channel d) All of the Above

7) The electron hole pairs generated in a photodiode are separated by the _____.
   a) Magnetic field b) Electric field
   c) Static field d) Depletion region

8) 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

9) Multimode graded index fibers exhibit for less intermodal dispersion than multimode step index fibers due to their _____.
   a) Structure b) Acceptance angle
   c) Refractive index profile d) Multipath reflection

10) 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 _____.
   a) Critical angle b) Acceptance angle
   c) Numerical aperture d) Skew ray

11) The internal quantum efficiency of LED decreases with _____.
   a) Increase in temp b) Decrease in temp
   c) Increase in pressure d) None of these

12) Laser is _____ optical source
   a) Non-coherent b) Coherent
   c) Both a) and b) 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
   c) Temperature sensitivity d) Failure characteristics

14) 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)

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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 $^{-1}$. 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 μW 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. **16**

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.

Section – II

Q.4 Answer any three **12**

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 μm. When the incident optical power is 0.5 μW, the output current from the device (after avalanche gain) is 11 μA. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

Q.5 Answer any two. **16**

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.

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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**

1) Laser is _____ optical source
   a) Non-coherent b) Coherent
   c) Both a) and b) d) None of these

2) 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

3) 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)

4) The requirement of detector is _____.
   a) High fidelity b) Larger size
   c) More numerical aperture d) All of above

5) A photodiode has a quantum efficiency of 70% when photos of energy $1.8x10^{-19}$ are incident upon it, then the responsivity of the photodiode is _____.
   a) 0.694 b) 0.723
   c) 0.369 d) 0.623

6) Wavelength division multiplexing is same as _____.
   a) FDM b) TDM
   c) DWDM d) None

7) In optical communication system, the light detector is: _____.
   a) Avalanche Photo Diode (APD)
   b) Positive Intrinsic Negative (PIN) diode
   c) Phototransistor
   d) Either a or b

8) Impact Ionization phenomenon occur in _____.
   a) p-n photodiode b) avalanche photodiode
   c) p-i-n photodiode d) none of these

9) The basic performance of WDM is determined by _____.
   a) Insertion loss
   b) Transmission loss
   c) Noise added in channel
   d) All of the Above

10) The electron hole pairs generated in a photodiode are separated by the _____.
   a) Magnetic field
   b) Electric field
   c) Static field
   d) Depletion region

11) 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

12) Multimode graded index fibers exhibit for less intermodal dispersion than multimode step index fibers due to their _____.
   a) Structure
   b) Acceptance angle
   c) Refractive index profile
   d) Multipath reflection

13) 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 _____.
   a) Critical angle
   b) Acceptance angle
   c) Numerical aperture
   d) Skew ray

14) The internal quantum efficiency of LED decreases with _____.
   a) Increase in temp
   b) Decrease in temp
   c) Increase in pressure
   d) None of these

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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 $^{-1}$. 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 μW 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. **16**

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.

Section – II

Q.4 Answer any three **12**

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 μm. When the incident optical power is 0.5 μW, the output current from the device (after avalanche gain) is 11 μA. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

Q.5 Answer any two. **16**

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.

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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**

1) Wavelength division multiplexing is same as _____.
   a) FDM b) TDM
   c) DWDM d) None

2) In optical communication system, the light detector is: _____.
   a) Avalanche Photo Diode (APD)
   b) Positive Intrinsic Negative (PIN) diode
   c) Phototransistor
   d) Either a or b

3) Impact Ionization phenomenon occur in _____.
   a) p-n photodiode b) avalanche photodiode
   c) p-i-n photodiode d) none of these

4) The basic performance of WDM is determined by _____.
   a) Insertion loss b) Transmission loss
   c) Noise added in channel d) All of the Above

5) The electron hole pairs generated in a photodiode are separated by the _____.
   a) Magnetic field b) Electric field
   c) Static field d) Depletion region

6) 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

7) Multimode graded index fibers exhibit for less intermodal dispersion than multimode step index fibers due to their _____.
   a) Structure b) Acceptance angle
   c) Refractive index profile d) Multipath reflection

8) 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 _____.
   a) Critical angle b) Acceptance angle
   c) Numerical aperture d) Skew ray

9) The internal quantum efficiency of LED decreases with _____.
   a) Increase in temp b) Decrease in temp
   c) Increase in pressure d) None of these

10) Laser is _____ optical source
   a) Non-coherent b) Coherent
   c) Both a) and b) d) None of these

11) 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

12) 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)

13) The requirement of detector is _____.
   a) High fidelity b) Larger size
   c) More numerical aperture d) All of above

14) A photodiode has a quantum efficiency of 70% when photos of energy $1.8x10^{-19}$ are incident upon it, then the responsivity of the photodiode is _____.
   a) 0.694 b) 0.723
   c) 0.369 d) 0.623

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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 $^{-1}$. 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 μW 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. **16**

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.

Section – II

Q.4 Answer any three **12**

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 μm. When the incident optical power is 0.5 μW, the output current from the device (after avalanche gain) is 11 μA. Determine the multiplication factor of the photodiode under these conditions.

d) Explain the concept of Link Design

Q.5 Answer any two. **16**

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.

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) GSM stands for _____.
   a) Global service for mobile b) Global scope for mobile
   c) Group of special machines d) Global system for mobile

2) The scheme in which each cell is allocated a predetermined set of voice channels is called as _____.
   a) Dynamic channel b) Fixed channel
   c) Demand channel d) Forward channel

3) In _____ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
   a) TDMA b) CDMA
   c) FDMA d) FGMA

4) The antenna which attempts to direct all its energy in a particular direction is called as a _____.
   a) Directional Antenna b) One to one Antenna
   c) Propagation Antenna d) Single Direction Antenna

5) Reflection is?
   a) Propagation mode b) Propagation mechanism
   c) Spread spectrum d) None of the above

6) Spot Beam antenna is used in which of the following multiple access technique?
   a) TDMA b) FDMA
   c) SDMA d) Both (a) and (b)

7) The model considered for both direct path and ground reflected propagation path between T-R is _____.
   a) Hata model b) Two ray model
   c) Free space model d) Okumura model

8) 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

9) In GSM the downlink frequency band is _____.
   a) 890-915 MHz
   b) 935-960 MHz
   c) 890-935 MHz
   d) 917-945 MHz

10) An interface which connects a BTS to a BSC is called _____ interface.
   a) Channel Interface
   b) Signaling Interface
   c) Abis Interface
   d) None of these

11) IMT 2000 stands for _____.
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

12) What is modulation technique used in IS-95 CDMA Reverse Channel?
   a) QPSK
   b) OPQSK
   c) MSK
   d) FSK

13) GSM is a _____ generation cellular system.
   a) First
   b) Second
   c) Third
   d) None of these

14) Each group of 26 consecutive TDMA frames is called a _____.
   a) Multi frame
   b) Mini frame
   c) Mainframe
   d) All of the above

SLR-FM-246

Seat No.		Set	P

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 $\blacktriangle = (2\,h_t h_r)/d$
(Where ▲- path difference between the Line of sight and ground reflected path)

Section – II

Q.4 Attempt any four of the following. **16**

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. **12**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) In GSM the downlink frequency band is _____.
   a) 890-915 MHz b) 935-960 MHz
   c) 890-935 MHz d) 917-945 MHz

3) An interface which connects a BTS to a BSC is called _____ interface.
   a) Channel Interface b) Signaling Interface
   c) Abis Interface d) None of these

4) IMT 2000 stands for _____.
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

5) What is modulation technique used in IS-95 CDMA Reverse Channel?
   a) QPSK b) OPQSK
   c) MSK d) FSK

6) GSM is a _____ generation cellular system.
   a) First b) Second
   c) Third d) None of these

7) Each group of 26 consecutive TDMA frames is called a _____.
   a) Multi frame b) Mini frame
   c) Mainframe d) All of the above

8) GSM stands for _____.
   a) Global service for mobile b) Global scope for mobile
   c) Group of special machines d) Global system for mobile

9) The scheme in which each cell is allocated a predetermined set of voice channels is called as _____.
   a) Dynamic channel
   b) Fixed channel
   c) Demand channel
   d) Forward channel

10) In _____ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
   a) TDMA
   b) CDMA
   c) FDMA
   d) FGMA

11) The antenna which attempts to direct all its energy in a particular direction is called as a _____.
   a) Directional Antenna
   b) One to one Antenna
   c) Propagation Antenna
   d) Single Direction Antenna

12) Reflection is?
   a) Propagation mode
   b) Propagation mechanism
   c) Spread spectrum
   d) None of the above

13) Spot Beam antenna is used in which of the following multiple access technique?
   a) TDMA
   b) FDMA
   c) SDMA
   d) Both (a) and (b)

14) The model considered for both direct path and ground reflected propagation path between T-R is _____.
   a) Hata model
   b) Two ray model
   c) Free space model
   d) Okumura model

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 $\blacktriangle = (2\, h_t h_r)/d$
(Where ▲- path difference between the Line of sight and ground reflected path)

Section - II

Q.4 Attempt any four of the following. **16**

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. **12**

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.

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) Reflection is?
   a) Propagation mode b) Propagation mechanism
   c) Spread spectrum d) None of the above

2) Spot Beam antenna is used in which of the following multiple access technique?
   a) TDMA b) FDMA
   c) SDMA d) Both (a) and (b)

3) The model considered for both direct path and ground reflected propagation path between T-R is _____.
   a) Hata model b) Two ray model
   c) Free space model d) Okumura model

4) 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

5) In GSM the downlink frequency band is _____.
   a) 890-915 MHz b) 935-960 MHz
   c) 890-935 MHz d) 917-945 MHz

6) An interface which connects a BTS to a BSC is called _____ interface.
   a) Channel Interface b) Signaling Interface
   c) Abis Interface d) None of these

7) IMT 2000 stands for _____.
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

8) What is modulation technique used in IS-95 CDMA Reverse Channel?
   a) QPSK b) OPQSK
   c) MSK d) FSK

9) GSM is a _____ generation cellular system.
   a) First b) Second
   c) Third d) None of these

10) Each group of 26 consecutive TDMA frames is called a _____.
   a) Multi frame
   b) Mini frame
   c) Mainframe
   d) All of the above

11) GSM stands for _____.
   a) Global service for mobile
   b) Global scope for mobile
   c) Group of special machines
   d) Global system for mobile

12) The scheme in which each cell is allocated a predetermined set of voice channels is called as _____.
   a) Dynamic channel
   b) Fixed channel
   c) Demand channel
   d) Forward channel

13) In _____ Frequency Spectrum is divided into smaller spectra and is allocated to each user.
   a) TDMA
   b) CDMA
   c) FDMA
   d) FGMA

14) The antenna which attempts to direct all its energy in a particular direction is called as a _____.
   a) Directional Antenna
   b) One to one Antenna
   c) Propagation Antenna
   d) Single Direction Antenna

SLR-FM-246

Seat No.	

Set R

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 $\blacktriangle = (2\,h_t h_r)/d$
(Where ▲- path difference between the Line of sight and ground reflected path)

Section – II

Q.4 Attempt any four of the following. **16**

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. **12**

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.

Seat No.		Set	S

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
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 Marks: 14

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

1) An interface which connects a BTS to a BSC is called _____ interface.
   a) Channel Interface b) Signaling Interface
   c) Abis Interface d) None of these

2) IMT 2000 stands for _____.
   a) International Mobile Telecommunication
   b) Interim Mobile Telecommunication
   c) International Mobile Technology
   d) None of these

3) What is modulation technique used in IS-95 CDMA Reverse Channel?
   a) QPSK b) OPQSK
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4) GSM is a _____ generation cellular system.
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5) Each group of 26 consecutive TDMA frames is called a _____.
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   b) Propagation mechanism
   c) Spread spectrum
   d) None of the above

11) Spot Beam antenna is used in which of the following multiple access technique?
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   b) FDMA
   c) SDMA
   d) Both (a) and (b)

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   b) Two ray model
   c) Free space model
   d) Okumura model

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   a) Uplink – QPSK, Downlink – BPSK
   b) Uplink – BPSK, Downlink – QPSK
   c) Uplink – BPSK, Downlink – BPSK
   d) None of the above

14) In GSM the downlink frequency band is _____.
   a) 890-915 MHz
   b) 935-960 MHz
   c) 890-935 MHz
   d) 917-945 MHz

SLR-FM-246

Seat No.	

Set S

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 $\blacktriangle = (2\, h_t h_r)/d$
(Where ▲- path difference between the Line of sight and ground reflected path)

Section - II

Q.4 Attempt any four of the following. **16**

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. **12**

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.

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

2) Which representation is most efficient to perform arithmetic operations?
   a) Sign magnitude b) 1's complements
   c) 2's complements d) None of these

3) Which register points to the first instruction to be executed when the 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

5) Floating point representation consist of _____.
   a) Mantissa b) exponent
   c) Both a) and b) d) none of these

6) To read the control words sequentially _____ is used.
   a) PC b) IR
   c) uPC d) None of these

7) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

8) In Processor DMA Stand for _____.
   a) Direct Memory Access b) Division Memory Access
   c) Direct mapping Access d) All of the above

9) What is not true about RISC?
   a) Large no of addressing modes
   b) Simple instruction
   c) Hardwired control unit
   d) A single chip processor

10) To interface 2048 bytes of memory, how many address lines are required?
   a) 8
   b) 9
   c) 10
   d) 11

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

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   a) Opcode b) Operand
   c) Register d) None of these

3) In Processor DMA Stand for _____.
   a) Direct Memory Access b) Division Memory Access
   c) Direct mapping Access d) All of the above

4) What is not true about RISC?
   a) Large no of addressing modes b) Simple instruction
   c) Hardwired control unit d) A single chip processor

5) To interface 2048 bytes of memory, how many address lines are required?
   a) 8 b) 9
   c) 10 d) 11

6) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

7) Which representation is most efficient to perform arithmetic operations?
   a) Sign magnitude b) 1's complements
   c) 2's complements d) None of these

8) Which register points to the first instruction to be executed when the processor starts.
   a) Accumulator b) Program counter
   c) Data register d) Instruction register

9) Speedup techniques of computer include _____.
   a) cache b) pipeline
   c) superscalar d) all of these

10) Floating point representation consist of _____.

a) Mantissa
b) exponent
c) Both a) and b)
d) none of these

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) What is not true about RISC?
   a) Large no of addressing modes b) Simple instruction
   c) Hardwired control unit d) A single chip processor

2) To interface 2048 bytes of memory, how many address lines are required?
   a) 8 b) 9
   c) 10 d) 11

3) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

4) Which representation is most efficient to perform arithmetic operations?
   a) Sign magnitude b) 1's complements
   c) 2's complements d) None of these

5) Which register points to the first instruction to be executed when the processor starts.
   a) Accumulator b) Program counter
   c) Data register d) Instruction register

6) Speedup techniques of computer include _____.
   a) cache b) pipeline
   c) superscalar d) all of these

7) Floating point representation consist of _____.
   a) Mantissa b) exponent
   c) Both a) and b) d) none of these

8) To read the control words sequentially _____ is used.
   a) PC b) IR
   c) uPC d) None of these

9) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

10) In Processor DMA Stand for _____.

a) Direct Memory Access
b) Division Memory Access
c) Direct mapping Access
d) All of the above

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Which register points to the first instruction to be executed when the processor starts.
   a) Accumulator b) Program counter
   c) Data register d) Instruction register

2) Speedup techniques of computer include _____.
   a) cache b) pipeline
   c) superscalar d) all of these

3) Floating point representation consist of _____.
   a) Mantissa b) exponent
   c) Both a) and b) d) none of these

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   a) PC b) IR
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5) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

6) In Processor DMA Stand for _____.
   a) Direct Memory Access b) Division Memory Access
   c) Direct mapping Access d) All of the above

7) What is not true about RISC?
   a) Large no of addressing modes b) Simple instruction
   c) Hardwired control unit d) A single chip processor

8) To interface 2048 bytes of memory, how many address lines are required?
   a) 8 b) 9
   c) 10 d) 11

9) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

10) Which representation is most efficient to perform arithmetic operations?

a) Sign magnitude
b) 1's complements
c) 2's complements
d) None of these

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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.
   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

4) 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

5) 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

6) Which of the following is characteristic of an operating system?
   a) resource management b) error recovery
   c) memory management d) All the above

7) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

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
   b) API
   c) library
   d) Assembly instructions

Seat No.	

Set **P**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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.
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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) Which of the following is characteristic of an operating system?
   a) resource management b) error recovery
   c) memory management d) All the above

2) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

3) 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

4) 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

5) To access the services of operating system, the interface is provided by the _____.
   a) System calls b) API
   c) library d) Assembly instructions

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

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.
   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

Seat No.	

Set **Q**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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.

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) 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 _____.
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   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

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 b) error recovery
   c) memory management d) All the above

9) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

10) 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

Seat No.	

Set **R**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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.

Seat No.	

Set **S**

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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 _____.
   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

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?
   a) resource management b) error recovery
   c) memory management d) All the above

5) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

6) 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

7) 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

8) To access the services of operating system, the interface is provided by the _____.
   a) System calls
   b) API
   c) library
   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

SLR-FM-248

Seat No.	

Set S

T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. 40

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-249

Seat No.	

Set P

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) Which of the following is a sensor that measures the movement of an object?
   a) Pressure sensor b) Motion sensor
   c) Action sensor d) Touch sensor

2) The common robotic arm has _____ degrees of freedom.
   a) Six b) Five
   c) Four d) Three

3) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   c) Robo 3D d) Roboextract

4) Robotic vehicles are used in _____.
   a) Remotely operated communication systems
   b) Space vehicles
   c) Undersea exploration
   d) All of the above

5) Programming of a robot can be done by _____.
   a) Force sensors b) Teach pendant programming
   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 _____.
   a) Touch sensor b) Humidity sensor
   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
   d) unifunctional and non-programmable manipulator

9) _____ can be used to measure the distance from a reference to the object in the field.
   a) Force sensor
   b) Pressure sensor
   c) Range sensor
   d) Torque sensor

10) 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

Seat No.	

Set **P**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

Seat No.	

Set **Q**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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 _____.
   a) Touch sensor b) Humidity sensor
   c) Proximity sensor d) Pressure sensor

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 b) Pressure sensor
   c) Range sensor d) Torque sensor

5) 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

6) Which of the following is a sensor that measures the movement of an object?
   a) Pressure sensor b) Motion sensor
   c) Action sensor d) Touch sensor

7) The common robotic arm has _____ degrees of freedom.
   a) Six b) Five
   c) Four d) Three

8) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   c) Robo 3D d) Roboextract

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
   b) Teach pendant programming
   c) Tactile sensors
   d) Touch sensors

Seat No.	

Set **Q**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

Seat No.	

Set **R**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) _____ can be used to measure the distance from a reference to the object in the field.
   a) Force sensor b) Pressure 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
   c) Action sensor d) Touch sensor

4) The common robotic arm has _____ degrees of freedom.
   a) Six b) Five
   c) Four d) Three

5) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   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

7) Programming of a robot can be done by _____.
   a) Force sensors b) Teach pendant programming
   c) Tactile sensors d) Touch sensors

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

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.	

Set **R**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

Seat No.	

Set **S**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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 process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   c) Robo 3D 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
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   c) To enhance the life of production machines
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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.
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   c) Range sensor d) Torque sensor

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

9) Which of the following is a sensor that measures the movement of an object?
   a) Pressure sensor
   b) Motion sensor
   c) Action sensor
   d) Touch sensor

10) The common robotic arm has _____ degrees of freedom.
   a) Six
   b) Five
   c) Four
   d) Three

Seat No.	

Set **S**

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

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

SLR-FM-250

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
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) 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

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

3) 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) $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$ b) $\sqrt{(R+j\omega L)(g+J\omega c)}$
   c) $\sqrt{1/LC}$ 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

9) 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 _____.
   a) transmitted frequency b) intermediate frequency
   c) received frequency d) none of these

11) TWT uses a helix _____.
   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

12) The π-mode of resonance in a traveling wave magnetron is characterizes by _____.
   a) n=N b) n=N/4
   c) n=N/2 d) none of the above

13) Electron bunching in reflex klystron occurs in the _____.
   a) input cavity only b) vicinity of repeller electrode
   c) centre of drift space d) none of these

14) A magnetron has average power of 100 watts and duty cycle 2%. Its peak power output power is _____.
   a) 50W b) 100W
   c) 5000W d) 10,000W

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

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_{mn} 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 **16**

a) An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE_{11} 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_{mn} mode in rectangular waveguide assuming wave is propagating in z-direction.

Section – II

Q.4 Attempt any three **12**

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 30KΩ, R_{sh} of output cavity is 40 KΩ. Determine- input RMS voltage, output RMS voltage.
e) Explain Zero mode of Magnetron.

Q.5 Attempt any two **16**

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 **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
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) 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

1) 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

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 _____.
   a) transmitted frequency b) intermediate frequency
   c) received frequency d) none of these

4) TWT uses a helix _____.
   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

5) The π-mode of resonance in a traveling wave magnetron is characterizes by _____.
   a) n=N b) n=N/4
   c) n=N/2 d) none of the above

6) Electron bunching in reflex klystron occurs in the _____.
   a) input cavity only b) vicinity of repeller electrode
   c) centre of drift space d) none of these

7) A magnetron has average power of 100 watts and duty cycle 2%. Its peak power output power is _____.
   a) 50W b) 100W
   c) 5000W d) 10,000W

8) In microwave, we take the elements as _____.
   a) lumped circuit element
   b) distributed circuit element
   c) both a) and b)
   d) None of above

9) The Wavelength of microwaves at 100 GHz wiII be_____.
   a) 3cm b) 0.3cm
   c) 0.03cm d) 0.3m

10) The transferred electron bulk effect occurs in _____.
   a) germanium b) silicon
   c) gallium arsenide d) boron

11) Waveguide may be considered as_____.
   a) high pass filter b) low pass filter
   c) band pass filter d) band reject filter

12) In case of matched load_____.
   a) transmission is zero
   b) reflection is zero
   c) reflection is unity
   d) transmission is equals to reflection

13) Tee's and junctions constitutes _____.
   a) single port network b) two port network
   c) Three port network d) three or more port network

14) The propagation constant of a transmission line is given by.
   a) $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$ b) $\sqrt{(R+j\omega L)(g+J\omega c)}$
   c) $\sqrt{1/LC}$ d) none of these

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

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_{mn} 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 **16**

a) An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE_{11} 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_{mn} mode in rectangular waveguide assuming wave is propagating in z-direction.

Section – II

Q.4 Attempt any three **12**

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 30KΩ, R_{sh} of output cavity is 40 KΩ. Determine- input RMS voltage, output RMS voltage.
e) Explain Zero mode of Magnetron.

Q.5 Attempt any two **16**

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.

SLR-FM-250

Seat No.	

Set R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
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) 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

1) In case of matched load_____.
   a) transmission is zero
   b) reflection is zero
   c) reflection is unity
   d) transmission is equals to reflection

2) Tee's and junctions constitutes _____.
   a) single port network b) two port network
   c) Three port network d) three or more port network

3) The propagation constant of a transmission line is given by.
   a) $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$ b) $\sqrt{(R+j\omega L)(g+J\omega c)}$
   c) $\sqrt{1/LC}$ d) none of these

4) 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

5) 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

6) The CAHO in MTI radar operates at the _____.
   a) transmitted frequency b) intermediate frequency
   c) received frequency d) none of these

7) TWT uses a helix _____.
   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

8) The π-mode of resonance in a traveling wave magnetron is characterizes by _____.
   a) n=N
   b) n=N/4
   c) n=N/2
   d) none of the above

9) Electron bunching in reflex klystron occurs in the _____.
   a) input cavity only
   b) vicinity of repeller electrode
   c) centre of drift space
   d) none of these

10) A magnetron has average power of 100 watts and duty cycle 2%. Its peak power output power is _____.
   a) 50W
   b) 100W
   c) 5000W
   d) 10,000W

11) In microwave, we take the elements as _____.
   a) lumped circuit element
   b) distributed circuit element
   c) both a) and b)
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12) The Wavelength of microwaves at 100 GHz wiII be_____.
   a) 3cm
   b) 0.3cm
   c) 0.03cm
   d) 0.3m

13) The transferred electron bulk effect occurs in _____.
   a) germanium
   b) silicon
   c) gallium arsenide
   d) boron

14) Waveguide may be considered as_____.
   a) high pass filter
   b) low pass filter
   c) band pass filter
   d) band reject filter

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

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_{mn} 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 **16**

a) An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE_{11} 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_{mn} mode in rectangular waveguide assuming wave is propagating in z-direction.

Section – II

Q.4 Attempt any three **12**

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 30KΩ, R_{sh} of output cavity is 40 KΩ. Determine- input RMS voltage, output RMS voltage.
e) Explain Zero mode of Magnetron.

Q.5 Attempt any two **16**

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 **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
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) 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

1) The CAHO in MTI radar operates at the _____.
   a) transmitted frequency b) intermediate frequency
   c) received frequency d) none of these

2) TWT uses a helix _____.
   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 π-mode of resonance in a traveling wave magnetron is characterizes by _____.
   a) n=N b) n=N/4
   c) n=N/2 d) none of the above

4) Electron bunching in reflex klystron occurs in the _____.
   a) input cavity only b) vicinity of repeller electrode
   c) centre of drift space d) none of these

5) A magnetron has average power of 100 watts and duty cycle 2%. Its peak power output power is _____.
   a) 50W b) 100W
   c) 5000W d) 10,000W

6) In microwave, we take the elements as _____.
   a) lumped circuit element
   b) distributed circuit element
   c) both a) and b)
   d) None of above

7) The Wavelength of microwaves at 100 GHz will be_____.
   a) 3cm b) 0.3cm
   c) 0.03cm d) 0.3m

8) The transferred electron bulk effect occurs in _____.
   a) germanium b) silicon
   c) gallium arsenide d) boron

9) Waveguide may be considered as_____.
   a) high pass filter
   b) low pass filter
   c) band pass filter
   d) band reject filter

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) $\sqrt{\frac{R+j\omega L}{G+j\omega C}}$
   b) $\sqrt{(R+j\omega L)(g+J\omega c)}$
   c) $\sqrt{1/LC}$
   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

SLR-FM-250

Seat No.	

Set S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
RADAR & MICROWAVE ENGINEERING

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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 **12**

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_{mn} 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 **16**

a) An air filled rectangular waveguide of inner dimensions 5 x 2 cm operates in TE_{11} 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_{mn} mode in rectangular waveguide assuming wave is propagating in z-direction.

Section – II

Q.4 Attempt any three **12**

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 30KΩ, R_{sh} of output cavity is 40 KΩ. Determine- input RMS voltage, output RMS voltage.

e) Explain Zero mode of Magnetron.

SLR-FM-250

Set S

Q.5 Attempt any two **16**

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.

SLR-FM-251

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and 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

Duration: 30 Minutes Marks: 14

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

1) SJMP instruction is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) None

2) 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

3) In 8051, SP register is _____ bit wide.
   a) 8 b) 16
   c) 32 d) None

4) What is the address of DPL _____.
   a) 83H b) 82H
   c) 81H d) 88H

5) In microcontroller & LCD interface, which line will instruct the LCD that microcontroller sending a data or command?
   a) DB0 b) RW
   c) EN d) RS

6) What are the address of SFR's IE, IP, PSW & TH 0 respectively?
   a) 99h,88h,90h,81h b) 87h,d 0h,8bh,8ch
   c) a8h,b8h,d 0h,8ch d) 98h,89h,d 0h,8ah

7) Out of following registers, which register is not bit addressable register?
   a) PSW b) TCON
   c) SBUF d) IE

8) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON b) INDF
   c) PCL d) STATUS

9) The PIC actually uses a _____ program counter.
   a) 12 bit b) 13 bit
   c) 14 bit d) 15 bit

10) Special Purpose Registers of PIC 16F877 are mapped into data space at ____.
   a) 00H-1FH
   b) 80H - 9FH
   c) both a & b
   d) none of these

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

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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.

Q.5 Solve any two. **16**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and 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

Duration: 30 Minutes Marks: 14

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

1) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON b) INDF
   c) PCL d) STATUS

2) The PIC actually uses a _____ program counter.
   a) 12 bit b) 13 bit
   c) 14 bit d) 15 bit

3) Special Purpose Registers of PIC 16F877 are mapped into data space at ____.
   a) 00H-1FH b) 80H - 9FH
   c) both a & b d) none of these

4) The Vref for ADC in PIC is selected by _____ register.
   a) ADCONO b) ADCON1
   c) ADRES d) PIR1

5) 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

6) PIR1 register contains _____ and PIE1 contains _____ bits.
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   b) Interrupt Flag, Interrupt Priority
   c) Interrupt Priority, Interrupt Flag
   d) Interrupt Flag, Interrupt Enable

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

8) SJMP instruction is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) none

9) 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

10) In 8051, SP register is _____ bit wide.
   a) 8 b) 16
   c) 32 d) None

11) What is the address of DPL _____.
   a) 83H b) 82H
   c) 81H d) 88H

12) In microcontroller & LCD interface, which line will instruct the LCD that microcontroller sending a data or command?
   a) DB0 b) RW
   c) EN d) RS

13) What are the address of SFR's IE, IP, PSW & TH 0 respectively?
   a) 99h,88h,90h,81h b) 87h,d 0h,8bh,8ch
   c) a8h,b8h,d 0h,8ch d) 98h,89h,d 0h,8ah

14) Out of following registers, which register is not bit addressable register?
   a) PSW b) TCON
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Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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.

Q.5 Solve any two. **16**

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.

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and 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

Duration: 30 Minutes Marks: 14

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

1) In microcontroller & LCD interface, which line will instruct the LCD that microcontroller sending a data or command?
   a) DB0 b) RW
   c) EN d) RS

2) What are the address of SFR's IE, IP, PSW & TH 0 respectively?
   a) 99h,88h,90h,81h b) 87h,d 0h,8bh,8ch
   c) a8h,b8h,d 0h,8ch d) 98h,89h,d 0h,8ah

3) Out of following registers, which register is not bit addressable register?
   a) PSW b) TCON
   c) SBUF d) IE

4) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON b) INDF
   c) PCL d) STATUS

5) The PIC actually uses a _____ program counter.
   a) 12 bit b) 13 bit
   c) 14 bit d) 15 bit

6) Special Purpose Registers of PIC 16F877 are mapped into data space at ____.
   a) 00H-1FH b) 80H - 9FH
   c) both a & b d) none of these

7) The Vref for ADC in PIC is selected by _____ register.
   a) ADCONO b) ADCON1
   c) ADRES d) PIR1

8) 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
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   a) Interrupt Priority, Interrupt Enable
   b) Interrupt Flag, Interrupt Priority
   c) Interrupt Priority, Interrupt Flag
   d) Interrupt Flag, Interrupt Enable

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14) What is the address of DPL _____.
   a) 83H b) 82H
   c) 81H d) 88H

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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.

Q.5 Solve any two. **16**

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.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and 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

Duration: 30 Minutes Marks: 14

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

1) Special Purpose Registers of PIC 16F877 are mapped into data space at ____.
   a) 00H-1FH b) 80H - 9FH
   c) both a & b d) none of these

2) The Vref for ADC in PIC is selected by _____ register.
   a) ADCONO b) ADCON1
   c) ADRES d) PIR1

3) 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

4) 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

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

6) SJMP instruction is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) none

7) 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

8) In 8051, SP register is _____ bit wide.
   a) 8 b) 16
   c) 32 d) none

9) What is the address of DPL _____.
   a) 83H b) 82H
   c) 81H d) 88H

10) In microcontroller & LCD interface, which line will instruct the LCD that microcontroller sending a data or command?
   a) DB0 b) RW
   c) EN d) RS

11) What are the address of SFR's IE, IP, PSW & TH 0 respectively?
   a) 99h,88h,90h,81h b) 87h,d 0h,8bh,8ch
   c) a8h,b8h,d 0h,8ch d) 98h,89h,d 0h,8ah

12) Out of following registers, which register is not bit addressable register?
   a) PSW b) TCON
   c) SBUF d) IE

13) Which of the following FSR is used for indirect addressing mode of PIC?
   a) INTCON b) INDF
   c) PCL d) STATUS

14) The PIC actually uses a _____ program counter.
   a) 12 bit b) 13 bit
   c) 14 bit d) 15 bit

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROCONTROLLERS AND APPLICATIONS

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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.

Q.5 Solve any two. **16**

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.

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 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) 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

1) SCR is used in _____.
   a) Voltage control applications b) high voltage
   c) high frequency d) None

2) SCR is a _____ device.
   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 d) None

4) TRIAC is antiparallel arrangement of _____.
   a) Diodes b) SCR
   c) Transistors d) None

5) In frequency synthesizer _____ IC is used.
   a) IC 1596 b) IC 565
   c) CD 4046 d) None

6) Timer is designed using _____.
   a) XR 2240 b) PT 100
   c) LM394 d) 1 N4007

7) PLC exchanges information via _____.
   a) Cables b) Sensors
   c) Input and output modules d) Output device

8) DC Drive is based on _____.
   a) Phase angle control b) Frequency control
   c) time control d) none

9) IC 74C926 is used for _____.
   a) Event counting b) Time
   c) Time and event d) None

10) XR2240 consists of _____.
   a) 8 bit programmable counter b) 4 bit programmable counter
   c) 8 digit programmable counter d) 4 digit programmable counter

11) Diac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) 4

12) Triac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) None

13) Timer counter is designed by _____ IC.
   a) IC XR 2240 b) 74C96
   c) Both a and b d) None

14) IC 1596 is used for _____.
   a) Modulation b) Demodulation
   c) Both a and b d) None

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS &SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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 **Attempt any three of the following questions.** **12**
- **a)** Explain construction and working of SCR.
- **b)** Explain difference between FSK demodulator and PSK demodulator.
- **c)** Explain design of frequency synthesizer using LM 565 and CD 4046.
- **d)** Compare between TRIAC and DIAC.

Q.3 **Attempt any one of the following questions.** **08**
- **a)** Explain the AC power controlling with DIAC and TRIAC with suitable examples.
- **b)** Explain Vl characteristics of DIAC and TRIAC.

Q.4 What are the different Commutation techniques of SCR? Also explain firing circuits of SCR. **08**

Section – II

Q.5 **Attempt any three of the following questions.** **12**
- **a)** Explain in detail J and K type Thermocouple.
- **b)** Explain design of counter using IC74C926.
- **c)** What is on/off and Propetional Control? Explain in brief.
- **d)** Differentiate between V to V, I to V and V to I converter.

Q.6 **Attempt any one of the following questions.** **08**
- **a)** Explain PLC architecture and Applications.
- **b)** Write short note on bottle filling plant and elevator control.

Q.7 Explain design procedure for 3.5 digit multirange digital voltmeter. **08**

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 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) 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

1) DC Drive is based on _____.
   a) Phase angle control b) Frequency control
   c) time control d) none

2) IC 74C926 is used for _____.
   a) Event counting b) Time
   c) Time and event d) None

3) XR2240 consists of _____.
   a) 8 bit programmable counter b) 4 bit programmable counter
   c) 8 digit programmable counter d) 4 digit programmable counter

4) Diac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) 4

5) Triac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) None

6) Timer counter is designed by _____ IC.
   a) IC XR 2240 b) 74C96
   c) Both a and b d) None

7) IC 1596 is used for _____.
   a) Modulation b) Demodulation
   c) Both a and b d) None

8) SCR is used in _____.
   a) Voltage control applications b) high voltage
   c) high frequency d) None

9) SCR is a _____ device.
   a) PNPN b) NNNP
   c) PPPN d) NPNP

10) Fan regular is based on _____.
   a) DC voltage controlling b) AC voltage controlling
   c) Both a and b d) None

11) TRIAC is antiparallel arrangement of _____.
   a) Diodes b) SCR
   c) Transistors d) None

12) In frequency synthesizer _____ IC is used.
   a) IC 1596 b) IC 565
   c) CD 4046 d) None

13) Timer is designed using _____.
   a) XR 2240 b) PT 100
   c) LM394 d) 1 N4007

14) PLC exchanges information via _____.
   a) Cables b) Sensors
   c) Input and output modules d) Output device

SLR-FM-252

Seat No.	

Set Q

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS &SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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 Attempt any three of the following questions. **12**
- **a)** Explain construction and working of SCR.
- **b)** Explain difference between FSK demodulator and PSK demodulator.
- **c)** Explain design of frequency synthesizer using LM 565 and CD 4046.
- **d)** Compare between TRIAC and DIAC.

Q.3 Attempt any one of the following questions. **08**
- **a)** Explain the AC power controlling with DIAC and TRIAC with suitable examples.
- **b)** Explain Vl characteristics of DIAC and TRIAC.

Q.4 What are the different Commutation techniques of SCR? Also explain firing circuits of SCR. **08**

Section – II

Q.5 Attempt any three of the following questions. **12**
- **a)** Explain in detail J and K type Thermocouple.
- **b)** Explain design of counter using IC74C926.
- **c)** What is on/off and Propetional Control? Explain in brief.
- **d)** Differentiate between V to V, I to V and V to I converter.

Q.6 Attempt any one of the following questions. **08**
- **a)** Explain PLC architecture and Applications.
- **b)** Write short note on bottle filling plant and elevator control.

Q.7 Explain design procedure for 3.5 digit multirange digital voltmeter. **08**

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 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) 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

1) In frequency synthesizer _____ IC is used.
   a) IC 1596 b) IC 565
   c) CD 4046 d) None

2) Timer is designed using _____.
   a) XR 2240 b) PT 100
   c) LM394 d) 1 N4007

3) PLC exchanges information via _____.
   a) Cables b) Sensors
   c) Input and output modules d) Output device

4) DC Drive is based on _____.
   a) Phase angle control b) Frequency control
   c) time control d) none

5) IC 74C926 is used for _____.
   a) Event counting b) Time
   c) Time and event d) None

6) XR2240 consists of _____.
   a) 8 bit programmable counter b) 4 bit programmable counter
   c) 8 digit programmable counter d) 4 digit programmable counter

7) Diac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) 4

8) Triac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) None

9) Timer counter is designed by _____ IC.
   a) IC XR 2240 b) 74C96
   c) Both a and b d) None

10) IC 1596 is used for _____.
   a) Modulation b) Demodulation
   c) Both a and b d) None

11) SCR is used in _____.
   a) Voltage control applications b) high voltage
   c) high frequency d) None

12) SCR is a _____ device.
   a) PNPN b) NNNP
   c) PPPN d) NPNP

13) Fan regular is based on _____.
   a) DC voltage controlling b) AC voltage controlling
   c) Both a and b d) None

14) TRIAC is antiparallel arrangement of _____.
   a) Diodes b) SCR
   c) Transistors d) None

SLR-FM-252

Seat No.	

Set R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS &SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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 Attempt any three of the following questions. **12**
- **a)** Explain construction and working of SCR.
- **b)** Explain difference between FSK demodulator and PSK demodulator.
- **c)** Explain design of frequency synthesizer using LM 565 and CD 4046.
- **d)** Compare between TRIAC and DIAC.

Q.3 Attempt any one of the following questions. **08**
- **a)** Explain the AC power controlling with DIAC and TRIAC with suitable examples.
- **b)** Explain Vl characteristics of DIAC and TRIAC.

Q.4 What are the different Commutation techniques of SCR? Also explain firing circuits of SCR. **08**

Section – II

Q.5 Attempt any three of the following questions. **12**
- **a)** Explain in detail J and K type Thermocouple.
- **b)** Explain design of counter using IC74C926.
- **c)** What is on/off and Propetional Control? Explain in brief.
- **d)** Differentiate between V to V, I to V and V to I converter.

Q.6 Attempt any one of the following questions. **08**
- **a)** Explain PLC architecture and Applications.
- **b)** Write short note on bottle filling plant and elevator control.

Q.7 Explain design procedure for 3.5 digit multirange digital voltmeter. **08**

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS & SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 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) 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

1) XR2240 consists of _____.
   a) 8 bit programmable counter b) 4 bit programmable counter
   c) 8 digit programmable counter d) 4 digit programmable counter

2) Diac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) 4

3) Triac contains _____ diodes.
   a) 1 b) 2
   c) 3 d) None

4) Timer counter is designed by _____ IC.
   a) IC XR 2240 b) 74C96
   c) Both a and b d) None

5) IC 1596 is used for _____.
   a) Modulation b) Demodulation
   c) Both a and b d) None

6) SCR is used in _____.
   a) Voltage control applications b) high voltage
   c) high frequency d) None

7) SCR is a _____ device.
   a) PNPN b) NNNP
   c) PPPN d) NPNP

8) Fan regular is based on _____.
   a) DC voltage controlling b) AC voltage controlling
   c) Both a and b d) None

9) TRIAC is antiparallel arrangement of _____.
   a) Diodes b) SCR
   c) Transistors d) None

10) In frequency synthesizer _____ IC is used.
   a) IC 1596 b) IC 565
   c) CD 4046 d) None

11) Timer is designed using _____.
   a) XR 2240 b) PT 100
   c) LM394 d) 1 N4007

12) PLC exchanges information via _____.
   a) Cables b) Sensors
   c) Input and output modules d) Output device

13) DC Drive is based on _____.
   a) Phase angle control b) Frequency control
   c) time control d) none

14) IC 74C926 is used for _____.
   a) Event counting b) Time
   c) Time and event d) None

SLR-FM-252

Seat No.	

Set S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRONICS APPLICATIONS &SYSTEM DESIGN

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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 Attempt any three of the following questions. **12**
- **a)** Explain construction and working of SCR.
- **b)** Explain difference between FSK demodulator and PSK demodulator.
- **c)** Explain design of frequency synthesizer using LM 565 and CD 4046.
- **d)** Compare between TRIAC and DIAC.

Q.3 Attempt any one of the following questions. **08**
- **a)** Explain the AC power controlling with DIAC and TRIAC with suitable examples.
- **b)** Explain Vl characteristics of DIAC and TRIAC.

Q.4 What are the different Commutation techniques of SCR? Also explain firing circuits of SCR. **08**

Section – II

Q.5 Attempt any three of the following questions. **12**
- **a)** Explain in detail J and K type Thermocouple.
- **b)** Explain design of counter using IC74C926.
- **c)** What is on/off and Propetional Control? Explain in brief.
- **d)** Differentiate between V to V, I to V and V to I converter.

Q.6 Attempt any one of the following questions. **08**
- **a)** Explain PLC architecture and Applications.
- **b)** Write short note on bottle filling plant and elevator control.

Q.7 Explain design procedure for 3.5 digit multirange digital voltmeter. **08**

SLR-FM-253

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) As compared to multimode step index fiber, a step index fiber has a _____ intermodal dispersion.
   a) High b) Low
   c) Same d) None of these

3) 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^{-1} b) 13.34 ns km^{-1}
   c) 0.133 ns km^{-1} d) 0.266 ns km^{-1}

4) 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

5) A fiber splice is a _____ joint formed between two individual optical fibers in field or factory.
   a) Permanent b) Temporary
   c) Permanent or Temporary d) None of the above

6) An anisotype heterojunction is a _____ junction.
   a) n-n b) p-p
   c) p-n d) a & b above

7) 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

8) Responsivity of photo diode is expressed in _____.
   a) A/W b) A-W
   c) W/A d) A^2-W

9) 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

10) 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

11) Interferometric technique is used to measure _____.
   a) Dispersion 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) Frequency
   c) Dispersion 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^{-19}J 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-253

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) When 10^{11} photons per second each with an energy of 1.28×10^{-19}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.

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) Responsivity of photo diode is expressed in _____.
   a) A/W b) A-W
   c) W/A d) A^2-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

7) A photodiode has a quantum efficiency of 70% when photons of energy 1.8×10^{-19}J are incident upon it, then the responsivity of the photodiode is _____.
   a) 0.694 b) 0.723
   c) 0.369 d) 0.623

8) 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

9) As compared to multimode step index fiber, a step index fiber has a _____ intermodal dispersion.
   a) High
   b) Low
   c) Same
   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^{-1}
   b) 13.34 ns km^{-1}
   c) 0.133 ns km^{-1}
   d) 0.266 ns km^{-1}

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
   b) Temporary
   c) Permanent or 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.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) When 10^{11} photons per second each with an energy of 1.28×10^{-19}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.

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) A fiber splice is a _____ joint formed between two individual optical fibers in field or factory.
   a) Permanent b) Temporary
   c) Permanent or Temporary d) None of the above

2) An anisotype heterojunction is a _____ junction.
   a) n-n b) p-p
   c) p-n d) a & b above

3) 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

4) Responsivity of photo diode is expressed in _____.
   a) A/W b) A-W
   c) W/A d) A^2-W

5) 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

6) 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

7) Interferometric technique is used to measure _____.
   a) Dispersion b) Numerical aperture
   c) Refractive index profile d) Total attenuation

8) Frequency domain measurements is the preferred method for acquiring the _____ of multimode optical fibers.
   a) Bandwidth b) Frequency
   c) Dispersion d) Wavelength

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^{-19}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
   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^{-1} b) 13.34 ns km^{-1}
   c) 0.133 ns km^{-1} d) 0.266 ns km^{-1}

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.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) When 10^{11} photons per second each with an energy of 1.28×10^{-19}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.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) Interferometric technique is used to measure _____.
   a) Dispersion b) Numerical aperture
   c) Refractive index profile d) Total attenuation

3) Frequency domain measurements is the preferred method for acquiring the _____ of multimode optical fibers.
   a) Bandwidth b) Frequency
   c) Dispersion d) Wavelength

4) WDM means _____.
   a) Wave Division Multiplexing
   b) Wavelength Division Multiplexing
   c) Width Division Multiplexing
   d) None of the above

5) A photodiode has a quantum efficiency of 70% when photons of energy 1.8×10^{-19}J are incident upon it, then the responsivity of the photodiode is _____.
   a) 0.694 b) 0.723
   c) 0.369 d) 0.623

6) 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

7) As compared to multimode step index fiber, a step index fiber has a _____ intermodal dispersion.
   a) High b) Low
   c) Same d) None of these

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 _____

a) 6.67 ns km^{-1} b) 13.34 ns km^{-1}
c) 0.133 ns km^{-1} d) 0.266 ns km^{-1}

9) Which of the following fiber manufacturing techniques can be used to draw fiber continuously?
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b) Modified chemical deposition technique
c) Plasma activated chemical deposition technique
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10) A fiber splice is a _____ joint formed between two individual optical fibers in field or factory.
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c) Permanent or Temporary d) None of the above

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a) n-n b) p-p
c) p-n d) a & b above

12) 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

13) Responsivity of photo diode is expressed in _____.
a) A/W b) A-W
c) W/A d) A^2-W

14) 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

SLR-FM-253

Seat No.		Set	S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPTICAL COMMUNICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) When 10^{11} photons per second each with an energy of 1.28×10^{-19}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.

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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) 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 spread b) Mean excess delay
   c) Excess delay spread d) 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

9) In GSM one hyperframe is made of _____.
   a) 2048 superframes b) 2048 mutiframes
   c) 2084 superframes d) 2084 mutiframes

10) The standard interface that connects a MS to BTS is called the _____ interface.
   a) Um b) A-bis
   c) A d) D

11) The _____ channel is used for sending short message including broadcast message.
   a) Forward traffic b) Sync
   c) Paging d) Pilot

12) In IS-95 CDMA forward channel bandwidth is of _____.
   a) 1.25 MHz b) 1.40 MHz
   c) 2 MHz d) 3 MHz

13) The channel bandwidth in W-CDMA is _____.
   a) 5 MHz b) 4 MHz
   c) 2 MHz d) 1.5 MHz

14) The data modulation used in forward channel in W-CDMA system is _____.
   a) BPSK b) QPSK
   c) Dual Channel QPSK d) OQPSK

SLR-FM-254

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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 Attempt any three of the following questions. **12**

a) Explain frequency reuse concept in cellular systems.
b) Explain Umbrella cell approach.
c) Explain log-distance path loss model and log-normal shadowing.
d) What is diversity? Explain in detail.
e) Write a note on Space Division Multiple Access (SDMA).

Q.3 Attempt any two of the following questions. **16**

a) Explain different methods used to improve capacity of cellular systems.
b) Elaborate the free space propagation model.
c) Explain frame structure, features, efficiency and number of channels in TDMA system.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Write a note on GPRS.
b) Describe the types of Handoff in GSM.
c) Explain GSM frame hierarchy.
d) Explain pilot channel, sync channel and paging channels in IS-95 CDMA system.
e) Explain reverse channel in W-CDMA.

Q.5 Attempt any two of the following questions. **16**

a) Give the detail comparison of IS-95, WCDMA and CDMA 2000.
b) Explain in detail GSM protocol architecture.
c) Explain with neat block diagram Access channel processing and reverse traffic channel processing in IS-95 CDMA system.

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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) Carrier Separation in Primary GSM system is of _____.
   a) 200 KHz b) 300 KHz
   c) 400 KHz d) 500 KHz

2) In GSM one hyperframe is made of _____.
   a) 2048 superframes b) 2048 mutiframes
   c) 2084 superframes d) 2084 mutiframes

3) The standard interface that connects a MS to BTS is called the _____ interface.
   a) Um b) A-bis
   c) A d) D

4) The _____ channel is used for sending short message including broadcast message.
   a) Forward traffic b) Sync
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5) In IS-95 CDMA forward channel bandwidth is of _____.
   a) 1.25 MHz b) 1.40 MHz
   c) 2 MHz d) 3 MHz

6) The channel bandwidth in W-CDMA is _____.
   a) 5 MHz b) 4 MHz
   c) 2 MHz d) 1.5 MHz

7) The data modulation used in forward channel in W-CDMA system is _____.
   a) BPSK b) QPSK
   c) Dual Channel QPSK d) OQPSK

8) 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

9) 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

10) Co-channel reuse ratio for cluster size 12 is _____.
   a) 4 b) 5
   c) 6 d) 7

11) 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

12) _____ is the Time Dispersion Parameter.
   a) RMS delay spread b) Mean excess delay
   c) Excess delay spread d) All of above

13) Data transmission for users of a _____ system is not continuous, but oocurs in bursts.
   a) FDMA b) TDMA
   c) SDMA d) SSMA

14) _____ requires tight RF filtering to minimize adjacent channel interference.
   a) FDMA b) TDMA
   c) SDMA d) SSMA

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt any three of the following questions. **12**

a) Explain frequency reuse concept in cellular systems.
b) Explain Umbrella cell approach.
c) Explain log-distance path loss model and log-normal shadowing.
d) What is diversity? Explain in detail.
e) Write a note on Space Division Multiple Access (SDMA).

Q.3 Attempt any two of the following questions. **16**

a) Explain different methods used to improve capacity of cellular systems.
b) Elaborate the free space propagation model.
c) Explain frame structure, features, efficiency and number of channels in TDMA system.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Write a note on GPRS.
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Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) 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) _____ is the Time Dispersion Parameter.
   a) RMS delay spread b) Mean excess delay
   c) Excess delay spread d) All of above

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   a) 200 KHz b) 300 KHz
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   a) 2048 superframes b) 2048 mutiframes
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   a) 1.25 MHz b) 1.40 MHz
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   a) 5 MHz b) 4 MHz
   c) 2 MHz d) 1.5 MHz

10) The data modulation used in forward channel in W-CDMA system is _____.
   a) BPSK b) QPSK
   c) Dual Channel QPSK d) OQPSK

11) Advantage of using Dynamic channel assignment is _____.
   a) Blocking is reduced
   b) Capacity of the system is increased
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12) Trunking in a cellular network refers to _____.
   a) Termination of a call
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   c) Accommodating large numbers of users in limited spectrum
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13) Co-channel reuse ratio for cluster size 12 is _____.
   a) 4 b) 5
   c) 6 d) 7

14) 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

SLR-FM-254

Seat No.	

Set R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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 Attempt any three of the following questions. **12**

a) Explain frequency reuse concept in cellular systems.
b) Explain Umbrella cell approach.
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a) Explain different methods used to improve capacity of cellular systems.
b) Elaborate the free space propagation model.
c) Explain frame structure, features, efficiency and number of channels in TDMA system.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Write a note on GPRS.
b) Describe the types of Handoff in GSM.
c) Explain GSM frame hierarchy.
d) Explain pilot channel, sync channel and paging channels in IS-95 CDMA system.
e) Explain reverse channel in W-CDMA.

Q.5 Attempt any two of the following questions. **16**

a) Give the detail comparison of IS-95, WCDMA and CDMA 2000.
b) Explain in detail GSM protocol architecture.
c) Explain with neat block diagram Access channel processing and reverse traffic channel processing in IS-95 CDMA system.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The standard interface that connects a MS to BTS is called the _____ interface.
   a) Um b) A-bis
   c) A d) D

2) The _____ channel is used for sending short message including broadcast message.
   a) Forward traffic b) Sync
   c) Paging d) Pilot

3) In IS-95 CDMA forward channel bandwidth is of _____.
   a) 1.25 MHz b) 1.40 MHz
   c) 2 MHz d) 3 MHz

4) The channel bandwidth in W-CDMA is _____.
   a) 5 MHz b) 4 MHz
   c) 2 MHz d) 1.5 MHz

5) The data modulation used in forward channel in W-CDMA system is _____.
   a) BPSK b) QPSK
   c) Dual Channel QPSK d) OQPSK

6) 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

7) 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

8) Co-channel reuse ratio for cluster size 12 is _____.
   a) 4 b) 5
   c) 6 d) 7

9) 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

10) _____ is the Time Dispersion Parameter.
   a) RMS delay spread
   b) Mean excess delay
   c) Excess delay spread
   d) All of above

11) Data transmission for users of a _____ system is not continuous, but oocurs in bursts.
   a) FDMA
   b) TDMA
   c) SDMA
   d) SSMA

12) _____ requires tight RF filtering to minimize adjacent channel interference.
   a) FDMA
   b) TDMA
   c) SDMA
   d) SSMA

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 _____.
   a) 2048 superframes
   b) 2048 mutiframes
   c) 2084 superframes
   d) 2084 mutiframes

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MOBILE COMMUNICATION

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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 Attempt any three of the following questions. **12**

a) Explain frequency reuse concept in cellular systems.
b) Explain Umbrella cell approach.
c) Explain log-distance path loss model and log-normal shadowing.
d) What is diversity? Explain in detail.
e) Write a note on Space Division Multiple Access (SDMA).

Q.3 Attempt any two of the following questions. **16**

a) Explain different methods used to improve capacity of cellular systems.
b) Elaborate the free space propagation model.
c) Explain frame structure, features, efficiency and number of channels in TDMA system.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Write a note on GPRS.
b) Describe the types of Handoff in GSM.
c) Explain GSM frame hierarchy.
d) Explain pilot channel, sync channel and paging channels in IS-95 CDMA system.
e) Explain reverse channel in W-CDMA.

Q.5 Attempt any two of the following questions. **16**

a) Give the detail comparison of IS-95, WCDMA and CDMA 2000.
b) Explain in detail GSM protocol architecture.
c) Explain with neat block diagram Access channel processing and reverse traffic channel processing in IS-95 CDMA system.

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

2) Which representation is most efficient to perform arithmetic operations?
   a) Sign magnitude b) 1's complements
   c) 2's complements d) None of these

3) Which register points to the first instruction to be executed when the 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

5) Floating point representation consist of _____.
   a) Mantissa b) exponent
   c) Both a) and b) d) none of these

6) To read the control words sequentially _____ is used.
   a) PC b) IR
   c) uPC d) None of these

7) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

8) In Processor DMA Stand for _____.
   a) Direct Memory Access b) Division Memory Access
   c) Direct mapping Access d) All of the above

9) What is not true about RISC?
   a) Large no of addressing modes
   b) Simple instruction
   c) Hardwired control unit
   d) A single chip processor

10) To interface 2048 bytes of memory, how many address lines are required?
   a) 8
   b) 9
   c) 10
   d) 11

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) To read the control words sequentially _____ is used.
   a) PC b) IR
   c) uPC d) None of these

2) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

3) In Processor DMA Stand for _____.
   a) Direct Memory Access b) Division Memory Access
   c) Direct mapping Access d) All of the above

4) What is not true about RISC?
   a) Large no of addressing modes b) Simple instruction
   c) Hardwired control unit d) A single chip processor

5) To interface 2048 bytes of memory, how many address lines are required?
   a) 8 b) 9
   c) 10 d) 11

6) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

7) Which representation is most efficient to perform arithmetic operations?
   a) Sign magnitude b) 1's complements
   c) 2's complements d) None of these

8) Which register points to the first instruction to be executed when the processor starts.
   a) Accumulator b) Program counter
   c) Data register d) Instruction register

9) Speedup techniques of computer include _____.
   a) cache b) pipeline
   c) superscalar d) all of these

10) Floating point representation consist of _____.

a) Mantissa
b) exponent
c) Both a) and b)
d) none of these

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) What is not true about RISC?
   a) Large no of addressing modes b) Simple instruction
   c) Hardwired control unit d) A single chip processor

2) To interface 2048 bytes of memory, how many address lines are required?
   a) 8 b) 9
   c) 10 d) 11

3) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

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   a) Accumulator b) Program counter
   c) Data register d) Instruction register

6) Speedup techniques of computer include _____.
   a) cache b) pipeline
   c) superscalar d) all of these

7) Floating point representation consist of _____.
   a) Mantissa b) exponent
   c) Both a) and b) d) none of these

8) To read the control words sequentially _____ is used.
   a) PC b) IR
   c) uPC d) None of these

9) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

10) In Processor DMA Stand for _____.

a) Direct Memory Access
b) Division Memory Access
c) Direct mapping Access
d) All of the above

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 50
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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Which register points to the first instruction to be executed when the processor starts.
   a) Accumulator b) Program counter
   c) Data register d) Instruction register

2) Speedup techniques of computer include _____.
   a) cache b) pipeline
   c) superscalar d) all of these

3) Floating point representation consist of _____.
   a) Mantissa b) exponent
   c) Both a) and b) d) none of these

4) To read the control words sequentially _____ is used.
   a) PC b) IR
   c) uPC d) None of these

5) Data used with assembly language instruction in processors are nothing but _____.
   a) Opcode b) Operand
   c) Register d) None of these

6) In Processor DMA Stand for _____.
   a) Direct Memory Access b) Division Memory Access
   c) Direct mapping Access d) All of the above

7) What is not true about RISC?
   a) Large no of addressing modes b) Simple instruction
   c) Hardwired control unit d) A single chip processor

8) To interface 2048 bytes of memory, how many address lines are required?
   a) 8 b) 9
   c) 10 d) 11

9) The addressing mode, where operand value is directly specified is called ____.
   a) Immediate b) Direct
   c) Definite d) Relative

10) Which representation is most efficient to perform arithmetic operations?

a) Sign magnitude
b) 1's complements
c) 2's complements
d) None of these

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER ORGANIZATION

Day & Date: Thursday, 28-12-2019 Max. Marks: 40
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) **40**

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.

SLR-FM-256

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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.
   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

4) 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

5) 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

6) Which of the following is characteristic of an operating system?
   a) resource management b) error recovery
   c) memory management d) All the above

7) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

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
   b) API
   c) library
   d) Assembly instructions

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) Which of the following is characteristic of an operating system?
   a) resource management b) error recovery
   c) memory management d) All the above

2) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

3) 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

4) 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

5) To access the services of operating system, the interface is provided by the _____.
   a) System calls b) API
   c) library d) Assembly instructions

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

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.
   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

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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.

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) 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

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   b) consists of a program and relevant information for its relocation.
   c) can itself performs the relocation of its address-sensitive portions.
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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
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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 b) error recovery
   c) memory management d) All the above

9) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

10) 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

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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 _____.
   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

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
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   c) paging suffers from internal fragmentation
   d) segmented memory can be paged

4) Which of the following is characteristic of an operating system?
   a) resource management b) error recovery
   c) memory management d) All the above

5) A thread is a _____.
   a) Task b) Process
   c) Program d) Light weight process

6) In _____ the processes under consideration must be independent: that is, the order in which they execute must be unconstrained by any synchronization requirements.
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   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 _____.
   a) memory partitioning b) virtual memory
   c) real memory d) memory organization

8) To access the services of operating system, the interface is provided by the _____.
   a) System calls
   b) API
   c) library
   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.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
OPERATING SYSTEM

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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. **40**

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-257

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) Which of the following is a sensor that measures the movement of an object?
   a) Pressure sensor b) Motion sensor
   c) Action sensor d) Touch sensor

2) The common robotic arm has _____ degrees of freedom.
   a) Six b) Five
   c) Four d) Three

3) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   c) Robo 3D d) Roboextract

4) Robotic vehicles are used in _____.
   a) Remotely operated communication systems
   b) Space vehicles
   c) Undersea exploration
   d) All of the above

5) Programming of a robot can be done by _____.
   a) Force sensors b) Teach pendant programming
   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 _____.
   a) Touch sensor b) Humidity sensor
   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
   d) unifunctional and non-programmable manipulator

9) _____ can be used to measure the distance from a reference to the object in the field.
   a) Force sensor
   b) Pressure sensor
   c) Range sensor
   d) Torque sensor

10) 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

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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 _____.
   a) Touch sensor b) Humidity sensor
   c) Proximity sensor d) Pressure sensor

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 b) Pressure sensor
   c) Range sensor d) Torque sensor

5) 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

6) Which of the following is a sensor that measures the movement of an object?
   a) Pressure sensor b) Motion sensor
   c) Action sensor d) Touch sensor

7) The common robotic arm has _____ degrees of freedom.
   a) Six b) Five
   c) Four d) Three

8) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   c) Robo 3D d) Roboextract

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
   b) Teach pendant programming
   c) Tactile sensors
   d) Touch sensors

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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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.

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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) _____ can be used to measure the distance from a reference to the object in the field.
   a) Force sensor b) Pressure 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
   c) Action sensor d) Touch sensor

4) The common robotic arm has _____ degrees of freedom.
   a) Six b) Five
   c) Four d) Three

5) The process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   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

7) Programming of a robot can be done by _____.
   a) Force sensors b) Teach pendant programming
   c) Tactile sensors d) Touch sensors

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

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.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 50
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 process of extracting, characterizing and interpreting information from images of 3 D world is referred as _____.
   a) Robot vision b) Robochar
   c) Robo 3D 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 sensor
   c) Range sensor d) Torque sensor

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

9) Which of the following is a sensor that measures the movement of an object?
   a) Pressure sensor
   b) Motion sensor
   c) Action sensor
   d) Touch sensor

10) The common robotic arm has _____ degrees of freedom.
   a) Six
   b) Five
   c) Four
   d) Three

SLR-FM-257

Seat No.	

Set S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ROBOTICS

Day & Date: Thursday, 28-11-2019 Max. Marks: 40
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: **40**

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.

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Number of links to connect n nodes in a mesh topology is =_____.
   a) N(N-1)/2 b) N(N-2)
   c) N d) N2

2) Which is the central device in star topology?
   a) STP server b) Hub
   c) PDC d) Router

3) The process-to-process delivery of the entire message is the responsibility of the _____ layer.
   a) Transport b) Application
   c) Physical d) Network

4) 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

5) The hamming distance between dataword, 110101 and 100010 is _____.
   a) 3 b) 4
   c) 2 d) 1

6) 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

7) To accomplish flow control, TCP uses a _____ window protocol.
   a) limited-size b) Sliding
   c) fixed-size d) None

8) An ACK segment, if carrying no data, consumes _____ sequence number(s).
   a) One b) Two
   c) NO d) Sixteen bit

9) The Ethernet address of system is of _____ bytes.
   a) 6 b) 4
   c) 32 d) 8

10) The bridge is suitable at _____ layer of OSI reference model.
   a) Application b) Transport
   c) Data-link d) Network

11) _____ is a Network device, used for repackage and convert data going from one environment to another.
   a) Router b) Gateway
   c) Repeater d) Switch

12) 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
   d) None of the above

13) _____ provide both static and dynamic address allocation which can be manual / automated.
   a) SMTP b) DHCP
   c) TELNET d) ICMP

14) The length of IPv6 is _____ bits.
   a) 32 b) 64
   c) 128 d) 16

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 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 Solve any three. **12**

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. **16**

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. **12**

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. **16**

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.

Seat No.	

Set | Q

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) An ACK segment, if carrying no data, consumes _____ sequence number(s).
   a) One b) Two
   c) NO d) Sixteen bit

2) The Ethernet address of system is of _____ bytes.
   a) 6 b) 4
   c) 32 d) 8

3) The bridge is suitable at _____ layer of OSI reference model.
   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
   c) Repeater d) Switch

5) 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
   d) None of the above

6) _____ provide both static and dynamic address allocation which can be manual / automated.
   a) SMTP b) DHCP
   c) TELNET d) ICMP

7) The length of IPv6 is _____ bits.
   a) 32 b) 64
   c) 128 d) 16

8) Number of links to connect n nodes in a mesh topology is =_____.
   a) N(N-1)/2 b) N(N-2)
   c) N d) N2

9) Which is the central device in star topology?
   a) STP server b) Hub
   c) PDC d) Router

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
   b) Sliding
   c) fixed-size
   d) None

Seat No.	

Set **Q**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 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 Solve any three. **12**

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. **16**

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. **12**

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. **16**

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.

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The hamming distance between dataword, 110101 and 100010 is _____.
   a) 3 b) 4
   c) 2 d) 1

2) 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

3) To accomplish flow control, TCP uses a _____ window protocol.
   a) limited-size b) Sliding
   c) fixed-size d) None

4) An ACK segment, if carrying no data, consumes _____ sequence number(s).
   a) One b) Two
   c) NO d) Sixteen bit

5) The Ethernet address of system is of _____ bytes.
   a) 6 b) 4
   c) 32 d) 8

6) The bridge is suitable at _____ layer of OSI reference model.
   a) Application b) Transport
   c) Data-link d) Network

7) _____ is a Network device, used for repackage and convert data going from one environment to another.
   a) Router b) Gateway
   c) Repeater d) Switch

8) 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
   d) None of the above

9) _____ provide both static and dynamic address allocation which can be manual / automated.
   a) SMTP b) DHCP
   c) TELNET d) ICMP

10) The length of IPv6 is _____ bits.
   a) 32 b) 64
   c) 128 d) 16

11) Number of links to connect n nodes in a mesh topology is =_____.
   a) N(N-1)/2 b) N(N-2)
   c) N d) N2

12) Which is the central device in star topology?
   a) STP server b) Hub
   c) PDC d) Router

13) The process-to-process delivery of the entire message is the responsibility of the _____ layer.
   a) Transport b) Application
   c) Physical d) Network

14) 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

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 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 Solve any three. **12**

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. **16**

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. **12**

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. **16**

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.

Seat No.	

Set | S

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The bridge is suitable at _____ layer of OSI reference model.
   a) Application b) Transport
   c) Data-link d) Network

2) _____ is a Network device, used for repackage and convert data going from one environment to another.
   a) Router b) Gateway
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   a) Systematic mail transfer protocol
   b) Simple mail transfer protocol
   c) DHCP
   d) None of the above

4) _____ provide both static and dynamic address allocation which can be manual / automated.
   a) SMTP b) DHCP
   c) TELNET d) ICMP

5) 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 =_____.
   a) N(N-1)/2 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

8) The process-to-process delivery of the entire message is the responsibility of the _____ layer.
   a) Transport b) Application
   c) Physical d) Network

9) 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

10) The hamming distance between dataword, 110101 and 100010 is _____.
   a) 3 b) 4
   c) 2 d) 1

11) 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

12) To accomplish flow control, TCP uses a _____ window protocol.
   a) limited-size b) Sliding
   c) fixed-size d) None

13) An ACK segment, if carrying no data, consumes _____ sequence number(s).
   a) One b) Two
   c) NO d) Sixteen bit

14) The Ethernet address of system is of _____ bytes.
   a) 6 b) 4
   c) 32 d) 8

Seat No.	

Set **S**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday, 07-12-2019 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 Solve any three. **12**

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. **16**

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. **12**

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. **16**

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.

Seat No.	

Set **P**

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

Duration: 30 Minutes Marks: 14

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

1) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB
   c) 8 KB d) 16 KB

2) Total number of available ADC inputs for LPC 2148 is _____.
   a) 06 b) 08
   c) 12 d) 14

3) In I^2c standard mode, speed is given as _____.
   a) 200 kbps b) 400 kbps
   c) 100 kbps d) None of above

4) ARM 7 Architecture support total _____ interrupt sources.
   a) 20 b) 30
   c) 32 d) 10

5) Inter-task or inter process communication in μcos II RTOS takes place using _____.
   a) Semaphore b) Message mailbox
   c) Message queues d) All

6) _____ software is the part of kernel responsible for determining which task will run next.
   a) Scheduler b) Semaphore
   c) Mailbox d) Mutex

7) SWAP instruction in the instruction set of ARM processor is a special case of _____ instruction.
   a) Arithmetic b) Logical
   c) Load-Store d) Branch

8) Exception priorities are in the following descending order _____.
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

9) Which of the following VIC having the highest priority?
   a) Vectored interrupt request
   b) Non vectored interrupt request
   c) Fast interrupt request
   d) None of the above

10) A thread is a _____ process.
   a) Multi process
   b) Inter thread process
   c) Light weight
   d) None of above

11) Round robin scheduling _____.
   a) Allows interactive task quicker access to processor
   b) Is quite complex to implement
   c) Gives each task the same chance at the processor
   d) None of above

12) The FIFO algorithm _____.
   a) Execute first the job that last entered the queue
   b) Execute first the job that first entered the queue
   c) Execute first the job that has been in the queue the longest
   d) None of above

13) Inter process can be done through _____.
   a) Mails
   b) Messages
   c) System calls
   d) Trap

14) A binary semaphore _____.
   a) has value one or zero
   b) is essential to binary commuter
   c) is used for synchronization
   d) is used for mutual exclusion

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEM 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.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four. **16**

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.

Q.3 Solve any Two. **12**

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. **16**

a) What are the features of μcos 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. **12**

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.

Seat No.	

Set **Q**

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

Duration: 30 Minutes Marks: 14

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

1) Exception priorities are in the following descending order _____.
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

2) Which of the following VIC having the highest priority?
   a) Vectored interrupt request b) Non vectored interrupt request
   c) Fast interrupt request d) None of the above

3) A thread is a _____ process.
   a) Multi process b) Inter thread process
   c) Light weight d) None of above

4) Round robin scheduling _____.
   a) Allows interactive task quicker access to processor
   b) Is quite complex to implement
   c) Gives each task the same chance at the processor
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5) The FIFO algorithm _____.
   a) Execute first the job that last entered the queue
   b) Execute first the job that first entered the queue
   c) Execute first the job that has been in the queue the longest
   d) None of above

6) Inter process can be done through _____.
   a) Mails b) Messages
   c) System calls d) Trap

7) A binary semaphore _____.
   a) has value one or zero b) is essential to binary commuter
   c) is used for synchronization d) is used for mutual exclusion

8) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB
   c) 8 KB d) 16 KB

9) Total number of available ADC inputs for LPC 2148 is _____.
   a) 06 b) 08
   c) 12 d) 14

10) In I^2c standard mode, speed is given as _____.
   a) 200 kbps b) 400 kbps
   c) 100 kbps d) None of above

11) ARM 7 Architecture support total _____ interrupt sources.
   a) 20 b) 30
   c) 32 d) 10

12) Inter-task or inter process communication in μcos II RTOS takes place using _____.
   a) Semaphore b) Message mailbox
   c) Message queues d) All

13) _____ software is the part of kernel responsible for determining which task will run next.
   a) Scheduler b) Semaphore
   c) Mailbox d) Mutex

14) SWAP instruction in the instruction set of ARM processor is a special case of _____ instruction.
   a) Arithmetic b) Logical
   c) Load-Store d) Branch

SLR-FM-259

Seat No.	

Set Q

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEM 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.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four. **16**

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.

Q.3 Solve any Two. **12**

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. **16**

a) What are the features of μcos 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. **12**

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.

Seat No.	

Set **R**

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

Duration: 30 Minutes Marks: 14

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

1) Inter-task or inter process communication in μcos II RTOS takes place using _____.
   a) Semaphore b) Message mailbox
   c) Message queues d) All

2) _____ software is the part of kernel responsible for determining which task will run next.
   a) Scheduler b) Semaphore
   c) Mailbox d) Mutex

3) SWAP instruction in the instruction set of ARM processor is a special case of _____ instruction.
   a) Arithmetic b) Logical
   c) Load-Store d) Branch

4) Exception priorities are in the following descending order _____.
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

5) Which of the following VIC having the highest priority?
   a) Vectored interrupt request b) Non vectored interrupt request
   c) Fast interrupt request d) None of the above

6) A thread is a _____ process.
   a) Multi process b) Inter thread process
   c) Light weight d) None of above

7) Round robin scheduling _____.
   a) Allows interactive task quicker access to processor
   b) Is quite complex to implement
   c) Gives each task the same chance at the processor
   d) None of above

8) The FIFO algorithm _____.
   a) Execute first the job that last entered the queue
   b) Execute first the job that first entered the queue
   c) Execute first the job that has been in the queue the longest
   d) None of above

9) Inter process can be done through _____.
   a) Mails b) Messages
   c) System calls d) Trap

10) A binary semaphore _____.
   a) has value one or zero b) is essential to binary commuter
   c) is used for synchronization d) is used for mutual exclusion

11) LPC2148 has _____ on chip flash program memory.
   a) 32 KB b) 64 KB
   c) 8 KB d) 16 KB

12) Total number of available ADC inputs for LPC 2148 is _____.
   a) 06 b) 08
   c) 12 d) 14

13) In I^2c standard mode, speed is given as _____.
   a) 200 kbps b) 400 kbps
   c) 100 kbps d) None of above

14) ARM 7 Architecture support total _____ interrupt sources.
   a) 20 b) 30
   c) 32 d) 10

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEM 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.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four. **16**

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.

Q.3 Solve any Two. **12**

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. **16**

a) What are the features of μcos 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. **12**

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.

Seat No.	

Set **S**

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

Duration: 30 Minutes Marks: 14

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

1) A thread is a _____ process.
   a) Multi process b) Inter thread process
   c) Light weight d) None of above

2) Round robin scheduling _____.
   a) Allows interactive task quicker access to processor
   b) Is quite complex to implement
   c) Gives each task the same chance at the processor
   d) None of above

3) The FIFO algorithm _____.
   a) Execute first the job that last entered the queue
   b) Execute first the job that first entered the queue
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   c) System calls d) Trap

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9) ARM 7 Architecture support total _____ interrupt sources.
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   c) Message queues
   d) All

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   a) Arithmetic
   b) Logical
   c) Load-Store
   d) Branch

13) Exception priorities are in the following descending order _____.
   a) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI or Undet
   b) Reset, Data, Abort, FIQ, IRQ, Pre Fetch Abort, SWI and Undet
   c) Reset, FIQ, IRQ, Data, Abort, Pre Fetch Abort, SWI or Undet
   d) Not in fixed order

14) Which of the following VIC having the highest priority?
   a) Vectored interrupt request
   b) Non vectored interrupt request
   c) Fast interrupt request
   d) None of the above

SLR-FM-259

Seat No.	

Set S

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEM 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.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four. **16**

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.

Q.3 Solve any Two. **12**

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. **16**

a) What are the features of μcos 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. **12**

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.

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) 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

2) What is the application of satellite systems?
   a) Weather forecasting b) Terrestrial communication
   c) Point to Point communication d) None of above

3) IN GPS which code has high accuracy?
   a) C/A b) P
   c) Both a and b d) None of above

4) Bent pipe is a type of _____.
   a) Waveguide b) LNB
   c) Transponder d) Antenna

5) The transmitter-receiver combination in the satellite is known as a _____.
   a) Relay b) Repeater
   c) Transponder d) Duplexer

6) The downlink frequency is lower than the uplink frequency.
   a) True b) False

7) 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

8) Which of the following bands cannot be used for satellite communication?
   a) MF b) Ku
   c) X d) C

9) 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

10) To cover all inhabited regions of the Earth, the number of geosynchronous communication satellites required _____..
   a) 5 b) 3
   c) 10 d) 2

11) 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

12) Frequency range of C-Band is _____.
   a) 16-32 GHZ b) 8-16 GHZ
   c) 4-8 GHZ d) 1-2 GHZ

13) GPS satellites are _____ Satellites.
   a) GEO b) MEO
   c) LEO d) None of above

14) The one way propagation time delay of MEO satellite is _____.
   a) 2.7ms b) 34.5ms
   c) 110ms d) 119.3ms

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 56
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. **16**

a) 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 $10m^2$.

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. **12**

a) Explain Orbital perturbations, Launchers and Launch vehicles.

b) Explain calculations for system noise temperature.

c) Explain Communication subsystem of satellite.

Section – II

Q.4 Attempt any four. **16**

a) Explain in detail RF Equipment for earth station.

b) Explain Tropospheric and ionospheric Scintillations.

c) What is GPS position location principle? Explain in detail.

d) Describe in detail VSAT system.

e) Explain Earth station testing.

Q.5 Attempt any two. **12**

a) Explain earth station design considerations.

b) Write a short note on Digital DBS TV.

c) Explain different propagation effects in satellite communication.

Seat No.	

Set **Q**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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   c) X d) C

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3) To cover all inhabited regions of the Earth, the number of geosynchronous communication satellites required _____..
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   a) Weather forecasting
   b) Terrestrial communication
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   b) P
   c) Both a and b
   d) None of above

11) Bent pipe is a type of _____.
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   c) Transponder
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12) The transmitter-receiver combination in the satellite is known as a _____.
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   b) Repeater
   c) Transponder
   d) Duplexer

13) The downlink frequency is lower than the uplink frequency.
   a) True
   b) False

14) 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

Seat No.	

Set **Q**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 56
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. **16**

a) 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 $10m^2$.

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. **12**

a) Explain Orbital perturbations, Launchers and Launch vehicles.

b) Explain calculations for system noise temperature.

c) Explain Communication subsystem of satellite.

Section – II

Q.4 Attempt any four. **16**

a) Explain in detail RF Equipment for earth station.

b) Explain Tropospheric and ionospheric Scintillations.

c) What is GPS position location principle? Explain in detail.

d) Describe in detail VSAT system.

e) Explain Earth station testing.

Q.5 Attempt any two. **12**

a) Explain earth station design considerations.

b) Write a short note on Digital DBS TV.

c) Explain different propagation effects in satellite communication.

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) The transmitter-receiver combination in the satellite is known as a _____.
   a) Relay b) Repeater
   c) Transponder d) Duplexer

2) The downlink frequency is lower than the uplink frequency.
   a) True b) False

3) 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

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

9) GPS satellites are _____ Satellites.
   a) GEO b) MEO
   c) LEO d) None of above

10) The one way propagation time delay of MEO satellite is _____.
   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

12) What is the application of satellite systems?
   a) Weather forecasting b) Terrestrial communication
   c) Point to Point communication d) None of above

13) IN GPS which code has high accuracy?
   a) C/A b) P
   c) Both a and b d) None of above

14) Bent pipe is a type of _____.
   a) Waveguide b) LNB
   c) Transponder d) Antenna

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 56
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. **16**

a) 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 $10m^2$.

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. **12**

a) Explain Orbital perturbations, Launchers and Launch vehicles.

b) Explain calculations for system noise temperature.

c) Explain Communication subsystem of satellite.

Section – II

Q.4 Attempt any four. **16**

a) Explain in detail RF Equipment for earth station.

b) Explain Tropospheric and ionospheric Scintillations.

c) What is GPS position location principle? Explain in detail.

d) Describe in detail VSAT system.

e) Explain Earth station testing.

Q.5 Attempt any two. **12**

a) Explain earth station design considerations.

b) Write a short note on Digital DBS TV.

c) Explain different propagation effects in satellite communication.

Seat No.	

Set **S**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) To cover all inhabited regions of the Earth, the number of geosynchronous communication satellites required _____..
   a) 5 b) 3
   c) 10 d) 2

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

3) Frequency range of C-Band is _____.
   a) 16-32 GHZ b) 8-16 GHZ
   c) 4-8 GHZ d) 1-2 GHZ

4) GPS satellites are _____ Satellites.
   a) GEO b) MEO
   c) LEO d) None of above

5) The one way propagation time delay of MEO satellite is _____.
   a) 2.7ms b) 34.5ms
   c) 110ms d) 119.3ms

6) 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

7) What is the application of satellite systems?
   a) Weather forecasting b) Terrestrial communication
   c) Point to Point communication d) None of above

8) IN GPS which code has high accuracy?
   a) C/A b) P
   c) Both a and b d) None of above

9) Bent pipe is a type of _____.
   a) Waveguide
   b) LNB
   c) Transponder
   d) Antenna

10) The transmitter-receiver combination in the satellite is known as a _____.
   a) Relay
   b) Repeater
   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

SLR-FM-260

Seat No.	

Set S

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday, 12-12-2019 Max. Marks: 56
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. **16**

a) 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 $10m^2$.

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. **12**

a) Explain Orbital perturbations, Launchers and Launch vehicles.

b) Explain calculations for system noise temperature.

c) Explain Communication subsystem of satellite.

Section – II

Q.4 Attempt any four. **16**

a) Explain in detail RF Equipment for earth station.

b) Explain Tropospheric and ionospheric Scintillations.

c) What is GPS position location principle? Explain in detail.

d) Describe in detail VSAT system.

e) Explain Earth station testing.

Q.5 Attempt any two. **12**

a) Explain earth station design considerations.

b) Write a short note on Digital DBS TV.

c) Explain different propagation effects in satellite communication.

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. 14

1) 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

2) A command to remove a relation from an SQL database.
   a) Delete Table < table name> b) Drop Table <table name>
   c) Erase Table <table name> d) Alter Table <table name>

3) σ 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)

4) 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

5) The operator that performs pattern matching is _____.
   a) BETWEEN b) EXISTS
   c) LIKE d) None of these

6) Which SQL command is used to sort the result set?
   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 b) Committed
   c) Partially Committed d) None of these

8) The characteristic/s of transaction/s is/are _____.
   a) Atomicity b) Durability
   c) Isolation d) All the above

9) Collection of operations that form a single logical unit of work are called ____.
   a) Transaction
   b) Data Commit
   c) Data Rollback
   d) Data Automation

10) The “all-or-none” property is commonly referred to as ____.
   a) Isolation
   b) Atomicity
   c) Durability
   d) All the above

11) Two phase locking protocol ensures _____.
   a) Serializability
   b) Freedom from deadlock
   c) Cascadeless Schedule
   d) None of these

12) A deadlock exists in the system if and only if the wait for graph contains a _____.
   a) Cycle
   b) Direction
   c) Rotation
   d) Bi-direction

13) I and J are _____ if they are operations in different transactions performed on the same data item, and at least one of them is a write operation.
   a) Conflicting
   b) Overwriting
   c) Isolated
   d) Durable

14) _____ 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

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 56
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. **12**

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. **16**

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 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. **12**

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. **16**

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.

Seat No.	

Set **Q**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) The characteristic/s of transaction/s is/are _____.
   a) Atomicity b) Durability
   c) Isolation d) All the above

2) Collection of operations that form a single logical unit of work are called ____.
   a) Transaction b) Data Commit
   c) Data Rollback d) Data Automation

3) The “all-or-none” property is commonly referred to as ____.
   a) Isolation b) Atomicity
   c) Durability d) All the above

4) Two phase locking protocol ensures _____.
   a) Serializability b) Freedom from deadlock
   c) Cascadeless Schedule d) None of these

5) A deadlock exists in the system if and only if the wait for graph contains a _____.
   a) Cycle b) Direction
   c) Rotation d) Bi-direction

6) I and J are _____ if they are operations in different transactions performed on the same data item, and at least one of them is a write operation.
   a) Conflicting b) Overwriting
   c) Isolated d) Durable

7) _____ 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

8) 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

9) A command to remove a relation from an SQL database.
   a) Delete Table < table name>
   b) Drop Table <table name>
   c) Erase Table <table name>
   d) Alter Table <table name>

10) σ 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)

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

13) Which SQL command is used to sort the result set?
   a) Sort by
   b) Sort
   c) Order
   d) Order by

14) A transaction is in ____ state after the final statement has been executed.
   a) Active
   b) Committed
   c) Partially Committed
   d) None of these

Seat No.	

Set **Q**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 56
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. **12**

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. **16**

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 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. **12**

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. **16**

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.

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) The operator that performs pattern matching is _____.
   a) BETWEEN b) EXISTS
   c) LIKE d) None of these

2) Which SQL command is used to sort the result set?
   a) Sort by b) Sort
   c) Order d) Order by

3) A transaction is in ____ state after the final statement has been executed.
   a) Active b) Committed
   c) Partially Committed d) None of these

4) The characteristic/s of transaction/s is/are _____.
   a) Atomicity b) Durability
   c) Isolation d) All the above

5) Collection of operations that form a single logical unit of work are called ____.
   a) Transaction b) Data Commit
   c) Data Rollback d) Data Automation

6) The “all-or-none” property is commonly referred to as ____.
   a) Isolation b) Atomicity
   c) Durability d) All the above

7) Two phase locking protocol ensures _____.
   a) Serializability b) Freedom from deadlock
   c) Cascadeless Schedule d) None of these

8) A deadlock exists in the system if and only if the wait for graph contains a _____.
   a) Cycle b) Direction
   c) Rotation d) Bi-direction

9) I and J are _____ if they are operations in different transactions performed on the same data item, and at least one of them is a write operation.
   a) Conflicting b) Overwriting
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10) _____ index has an index entry for every search key value in the data file.
   a) Sparse
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   c) Both a and b
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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.
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   b) Drop Table <table name>
   c) Erase Table <table name>
   d) Alter Table <table name>

13) σ year > 2009 (book ⋈ 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
   b) Group
   c) group set
   d) group attribute

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 56
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. **12**

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.

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a) Write SQL queries for following statements.
Student (Enrno, name, courseld, emailld, cellno)
Course (courseld, course_nm, duration)
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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. **12**

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. **16**

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.

Seat No.	

Set **S**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) The “all-or-none” property is commonly referred to as ____.
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   c) Durability d) All the above

2) Two phase locking protocol ensures _____.
   a) Serializability b) Freedom from deadlock
   c) Cascadeless Schedule d) None of these

3) A deadlock exists in the system if and only if the wait for graph contains a _____.
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   a) Sparse b) Dense
   c) Both a and b d) None of these

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   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

7) A command to remove a relation from an SQL database.
   a) Delete Table < table name> b) Drop Table <table name>
   c) Erase Table <table name> d) Alter Table <table name>

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   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)

9) We apply the aggregate function to a group of sets of tuples using the _____ clause.
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   b) Group
   c) group set
   d) group attribute

10) The operator that performs pattern matching is _____.
   a) BETWEEN
   b) EXISTS
   c) LIKE
   d) None of these

11) Which SQL command is used to sort the result set?
   a) Sort by
   b) Sort
   c) Order
   d) Order by

12) A transaction is in ____ state after the final statement has been executed.
   a) Active
   b) Committed
   c) Partially Committed
   d) None of these

13) The characteristic/s of transaction/s is/are _____.
   a) Atomicity
   b) Durability
   c) Isolation
   d) All the above

14) Collection of operations that form a single logical unit of work are called ____.
   a) Transaction
   b) Data Commit
   c) Data Rollback
   d) Data Automation

SLR-FM-261

Seat No.	

Set S

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATABASE MANAGEMENT SYSTEM (DBMS)

Day & Date: Saturday,14-12-2019 Max. Marks: 56
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. **12**

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. **16**

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 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. **12**

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. **16**

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.

Seat No.	

Set P

B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE & VIDEO PROCESSING

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. 14

1) Smallest part of an neighbour pixels is called as _____.
   a) Pixel b) Pel
   c) Kernel d) Coefficient

2) Pixel having Euclidean distance from f(x,y) from a shape _____ with radius centred at (x, y).
   a) Disk b) Diamond
   c) Square d) Pyramid

3) YUV color models family are useful in _____ applications.
   a) Display devices b) Printing applications
   c) Color TV broadcasting d) None

4) $s= c\ r^{v}$, where S-output grey level, r-input grey level, c-positive constant, v-positive constant; means _____.
   a) Negative b) Log transform
   c) Bit plane slicing d) Power law

5) If number of storage bits are 524288 for 8-bit image, then size of image is _____.
   a) 256 x 256 b) 128 x 128
   c) 512 x 512 d) 1024 x 1024

6) $H(U,V) = 1 - e\frac{-D^2(U,V)}{2\sigma^2}$ is equation for _____ in frequency domain.
   a) Butterworth HPF b) Gaussian HPF
   c) Ideal HPF d) None of these

7) Full color image means _____.
   a) 8-bit b) 24-bit
   c) 16-bit d) 4-bit

8) The symbol ★ indicates _____.
   a) Correlation b) Convolution
   c) Multiplication d) None

9) The equation $Hi(U,V) = \frac{1}{H(U,V)}$ for _____ filter.
   a) Inverse filter b) Pseudo-Inverse
   c) Weiner d) None

10) Digital video can be obtained by sampling analog video in the _____ direction along the scan lines.
   a) Horizontal
   b) Vertical
   c) Ratsra
   d) None

11) 2-D motion, also called _____.
   a) Rejected motion
   b) Projected motion
   c) Optical flow motion
   d) None

12) $\frac{\partial s_c(x;t)}{\partial x_1} v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2} v_2(x,t) + \frac{\partial s_c(x;t)}{\partial t} = 0$ is called as _____.
   a) Optical flow equation
   b) Motion estimation
   c) optimization method
   d) None

13) The symbol $\ominus$ represents _____ operation.
   a) Erosion
   b) Dilation
   c) Thinning
   d) Thickening

14) The PDF of pepper and salt noise is represented by _____.
   a) $\mathrm{P(z) = Pa \ for\, Z = a}$
      $\mathrm{= Pb \ for\, Z = b}$
      $\mathrm{= 0\ otherwise}$
   b) $\mathrm{P(z) = \frac{1}{b-a} \ for\, a < z < b}$
   c) $\mathrm{P(z) = ae^{-az} \ for\, Z > 0}$
   d) none

Seat No.	

Set **P**

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. **16**

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. **12**

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. **16**

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. **12**

a) Explain Inverse Filter for image restoration.
b) Explain 2-D rectangular sampling.
c) Explain Optical flow equation.

Seat No.	

Set **Q**

B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE & VIDEO PROCESSING

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) The symbol ★ indicates _____.
   a) Correlation b) Convolution
   c) Multiplication d) None

2) The equation $\mathrm{Hi(U,V)} = \frac{1}{\mathrm{H(U,V)}}$ for _____ filter.
   a) Inverse filter b) Pseudo-Inverse
   c) Weiner d) None

3) Digital video can be obtained by sampling analog video in the _____ direction along the scan lines.
   a) Horizontal b) Vertical
   c) Ratsra d) None

4) 2-D motion, also called _____.
   a) Rejected motion b) Projected motion
   c) Optical flow motion d) None

5) $\frac{\partial s_c(x;t)}{\partial x_1} v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2} v_2(x,t) + \frac{\partial s_c(x;t)}{\partial t} = 0$ is called as _____.
   a) Optical flow equation b) Motion estimation
   c) optimization method d) None

6) The symbol ⊖ represents _____ operation.
   a) Erosion b) Dilation
   c) Thinning d) Thickening

7) The PDF of pepper and salt noise is represented by _____.
   a) $\mathrm{P(z)} = \mathrm{Pa}$ for $\mathrm{Z} = \mathrm{a}$
      $= \mathrm{Pb}$ for $\mathrm{Z} = \mathrm{b}$
      $= 0$ otherwise
   b) $\mathrm{P(z)} = \frac{1}{\mathrm{b} - \mathrm{a}}$ for $\mathrm{a} < z < \mathrm{b}$
   c) $\mathrm{P(z)} = \mathrm{ae}^{-\mathrm{az}}$ for $\mathrm{Z} > 0$
   d) none

8) Smallest part of an neighbour pixels is called as _____.
   a) Pixel b) Pel
   c) Kernel d) Coefficient

9) Pixel having Euclidean distance from f(x,y) from a shape _____ with radius centred at (x, y).
   a) Disk
   b) Diamond
   c) Square
   d) Pyramid

10) YUV color models family are useful in _____ applications.
   a) Display devices
   b) Printing applications
   c) Color TV broadcasting
   d) None

11) $s= c\ r^{v}$, where S-output grey level, r-input grey level, c-positive constant, v-positive constant; means _____.
   a) Negative
   b) Log transform
   c) Bit plane slicing
   d) Power law

12) If number of storage bits are 524288 for 8-bit image, then size of image is _____.
   a) 256 x 256
   b) 128 x 128
   c) 512 x 512
   d) 1024 x 1024

13) $H(U,V) = 1 - e^{\frac{-D^2(U,V)}{2\sigma^2}}$ is equation for _____ in frequency domain.
   a) Butterworth HPF
   b) Gaussian HPF
   c) Ideal HPF
   d) None of these

14) Full color image means _____.
   a) 8-bit
   b) 24-bit
   c) 16-bit
   d) 4-bit

Seat No.	

Set **Q**

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. **16**

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. **12**

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. **16**

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. **12**

a) Explain Inverse Filter for image restoration.
b) Explain 2-D rectangular sampling.
c) Explain Optical flow equation.

Seat No.	

Set **R**

B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE & VIDEO PROCESSING

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) If number of storage bits are 524288 for 8-bit image, then size of image is _____.
   a) 256 x 256 b) 128 x 128
   c) 512 x 512 d) 1024 x 1024

2) $\mathrm{H(U,V)} = 1 - \mathrm{e}^{\frac{-\mathrm{D}^2(\mathrm{U,V})}{2\sigma^2}}$ is equation for _____ in frequency domain.
   a) Butterworth HPF b) Gaussian HPF
   c) Ideal HPF d) None of these

3) Full color image means _____.
   a) 8-bit b) 24-bit
   c) 16-bit d) 4-bit

4) The symbol ★ indicates _____.
   a) Correlation b) Convolution
   c) Multiplication d) None

5) The equation $\mathrm{Hi(U,V)} = \frac{1}{\mathrm{H(U,V)}}$ for _____ filter.
   a) Inverse filter b) Pseudo-Inverse
   c) Weiner d) None

6) Digital video can be obtained by sampling analog video in the _____ direction along the scan lines.
   a) Horizontal b) Vertical
   c) Ratsra d) None

7) 2-D motion, also called _____.
   a) Rejected motion b) Projected motion
   c) Optical flow motion d) None

8) $\frac{\partial s_c(x;t)}{\partial x_1} v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2} v_2(x,t) + \frac{\partial s_c(x;t)}{\partial t} = 0$ is called as _____.
   a) Optical flow equation b) Motion estimation
   c) optimization method d) None

9) The symbol ⊖ represents _____ operation.
   a) Erosion b) Dilation
   c) Thinning d) Thickening

10) The PDF of pepper and salt noise is represented by _____.
   a) $P(z) = Pa \text{ for } Z = a$
      $= Pb \text{ for } Z = b$
      $= 0$ otherwise
   b) $P(z) = \frac{1}{b-a} \text{ for } a < z < b$
   c) $P(z) = ae^{-az} \text{ for } Z > 0$
   d) none

11) Smallest part of an neighbour pixels is called as _____.
   a) Pixel b) Pel
   c) Kernel d) Coefficient

12) Pixel having Euclidean distance from f(x,y) from a shape _____ with radius centred at (x, y).
   a) Disk b) Diamond
   c) Square d) Pyramid

13) YUV color models family are useful in _____ applications.
   a) Display devices b) Printing applications
   c) Color TV broadcasting d) None

14) $s = c\, r^{v}$, where S-output grey level, r-input grey level, c-positive constant, v-positive constant; means _____.
   a) Negative b) Log transform
   c) Bit plane slicing d) Power law

Seat No.	

Set **R**

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. **16**

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.

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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. **12**

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. **16**

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. **12**

a) Explain Inverse Filter for image restoration.
b) Explain 2-D rectangular sampling.
c) Explain Optical flow equation.

Seat No.	

Set **S**

B.E. (Part –I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE & VIDEO PROCESSING

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Digital video can be obtained by sampling analog video in the _____ direction along the scan lines.
   a) Horizontal b) Vertical
   c) Ratsra d) None

2) 2-D motion, also called _____.
   a) Rejected motion b) Projected motion
   c) Optical flow motion d) None

3) $\frac{\partial s_c(x;t)}{\partial x_1} v_1(x,t) + \frac{\partial s_c(x;t)}{\partial x_2} v_2(x,t) + \frac{\partial s_c(x;t)}{\partial t} = 0$ is called as _____.
   a) Optical flow equation b) Motion estimation
   c) optimization method d) None

4) The symbol $\ominus$ represents _____ operation.
   a) Erosion b) Dilation
   c) Thinning d) Thickening

5) The PDF of pepper and salt noise is represented by _____.
   a) $\mathrm{P(z)} = \mathrm{Pa}$ for $\mathrm{Z} = \mathrm{a}$
   $= \mathrm{Pb}$ for $\mathrm{Z} = \mathrm{b}$
   $= 0$ otherwise
   b) $\mathrm{P(z)} = \frac{1}{\mathrm{b} - \mathrm{a}}$ for $\mathrm{a} < z < \mathrm{b}$
   c) $\mathrm{P(z)} = \mathrm{ae}^{-\mathrm{az}}$ for $\mathrm{Z} > 0$
   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).
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   c) Square d) Pyramid

8) YUV color models family are useful in _____ applications.
   a) Display devices b) Printing applications
   c) Color TV broadcasting d) None

9) s= c r^v, where S-output grey level, r-input grey level, c-positive constant, v-positive constant; means _____.
   a) Negative
   b) Log transform
   c) Bit plane slicing
   d) Power law

10) If number of storage bits are 524288 for 8-bit image, then size of image is _____.
   a) 256 x 256
   b) 128 x 128
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   d) 1024 x 1024

11) $\mathrm{H(U,V)} = 1 - \mathrm{e}^{\frac{-\mathrm{D}^2\,(\mathrm{U,V})}{2\sigma^2}}$ is equation for _____ in frequency domain.
   a) Butterworth HPF
   b) Gaussian HPF
   c) Ideal 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 ★ indicates _____.
   a) Correlation
   b) Convolution
   c) Multiplication
   d) None

14) The equation $\mathrm{Hi(U,V)} = \frac{1}{\mathrm{H(U,V)}}$ for _____ filter.
   a) Inverse filter
   b) Pseudo-Inverse
   c) Weiner
   d) None

SLR-FM-262

Seat No.	

Set S

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. **16**

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
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6	2	7	6	0
2	6	6	5	1
0	3	2	2	1

Q.3 Attempt any two. **12**

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. **16**

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. **12**

a) Explain Inverse Filter for image restoration.
b) Explain 2-D rectangular sampling.
c) Explain Optical flow equation.

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) 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

2) The linear filtering operation followed by down sampling on x(n) is not time invariant.
   a) True b) False

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

4) 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

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

7) Power spectrum describes distribution of _____ under frequency domain.
   a) Mean b) Variance
   c) Gaussian d) None of the mentioned

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

10) Autocorrelation function of white noise will have?
   a) Strong peak
   b) Infinite peak
   c) Weak peak
   d) None of the mentioned

11) Rate of convergence is defined by _____ of algorithm.
   a) Time span
   b) Number of iterations
   c) Accuracy
   d) Complexity

12) Computational complexity is a measure of _____.
   a) Time
   b) Number of iterations
   c) Number of operations
   d) Accuracy

13) 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

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

Seat No.	

Set **P**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set | Q

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. 14

1) 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
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2) 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

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 b) Number of iterations
   c) Accuracy d) Complexity

5) Computational complexity is a measure of _____.
   a) Time b) Number of iterations
   c) Number of operations d) Accuracy

6) Which of the following is a method for implementing a FIR system?
   a) Direct form b) Cascade form
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7) 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

8) 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

9) The linear filtering operation followed by down sampling on x(n) is not time invariant.
   a) True b) False

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 function
   b) Non negative function
   c) Periodic
   d) All of the mentioned

14) Power spectrum describes distribution of _____ under frequency domain.
   a) Mean
   b) Variance
   c) Gaussian
   d) None of the mentioned

Seat No.	

Set **Q**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) 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

2) Power spectral density function is a _____.
   a) Real and even function b) Non negative function
   c) Periodic d) All of the mentioned

3) Power spectrum describes distribution of _____ under frequency domain.
   a) Mean b) Variance
   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 _____.
   a) Energy of the signal b) Power of the signal
   c) Its area in frequency domain d) None of the mentioned

6) Autocorrelation function of white noise will have?
   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
   c) Accuracy d) Complexity

8) Computational complexity is a measure of _____.
   a) Time b) Number of iterations
   c) Number of operations d) Accuracy

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

Seat No.	

Set **R**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set **S**

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Autocorrelation function of white noise will have?
   a) Strong peak b) Infinite peak
   c) Weak peak d) None of the mentioned

2) Rate of convergence is defined by _____ of algorithm.
   a) Time span b) Number of iterations
   c) Accuracy d) Complexity

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 b) S-plane to Z-plane
   c) S-plane to J-plane d) J-plane to Z-plane

6) 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

7) The linear filtering operation followed by down sampling on x(n) is not time invariant.
   a) True b) False

8) 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

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

13) 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

SLR-FM-265

Seat No.		Set	S

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set **P**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 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

Duration: 30 Minutes Marks: 14

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

1) The topology requires multipoint connection _____.
   a) Star b) Mesh
   c) Ring d) Bus

2) In this topology there is a central controller or hub _____.
   a) Star b) Mesh
   c) Ring d) Bus

3) The physical layer is responsible for moving _____ from one (node) to the next.
   a) segments b) Frames
   c) bits d) Datagram

4) Which one of the following task is not done by data link layer?
   a) framing b) error control
   c) flow control d) channel coding

5) The address space of IPV4 is _____.
   a) 2^{32} b) 2^{16}
   c) 2^{8} d) None of these

6) The port number 1011 is _____ port number.
   a) registered b) well-known
   c) dynamic d) none of these

7) _____ is an example of connectionless simple protocol.
   a) IP b) TCP
   c) UDP d) None of these

8) Which protocol does Ping use?
   a) TCP b) ARP
   c) ICMP d) BootP

9) Which of the following devices is a PC component that connects the computer to the network?
   a) Bridge b) NIC
   c) DNS Server d) Gateway

10) To deliver a message to the correct application program running on a host, the _____ address must be consulted.
   a) IP
   b) MAC
   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 _____
   a) STT
   b) RTT
   c) PTT
   d) None of the these

12) Mode of data transfer in FTP, using protocol is _____.
   a) Stream mode
   b) Block mode
   c) Compressed mode
   d) None of these

13) The DHCP server can provide the _____ of the IP addresses.
   a) dynamic allocation
   b) automatic allocation
   c) static allocation
   d) all of these

14) Header size of the ICMP message is _____.
   a) 8-bytes
   b) 8-bits
   c) 16-bytes
   d) 16-bits

Seat No.	

Set **P**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Max. Marks: 56
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: **12**

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: **16**

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: **12**

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. **16**

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.

Seat No.	

Set **Q**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 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

Duration: 30 Minutes Marks: 14

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

1) Which protocol does Ping use?
   a) TCP b) ARP
   c) ICMP d) BootP

2) Which of the following devices is a PC component that connects the computer to the network?
   a) Bridge b) NIC
   c) DNS Server d) Gateway

3) To deliver a message to the correct application program running on a host, the _____ address must be consulted.
   a) IP b) MAC
   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 _____
   a) STT b) RTT
   c) PTT d) None of the these

5) Mode of data transfer in FTP, using protocol is _____.
   a) Stream mode b) Block mode
   c) Compressed mode d) None of these

6) The DHCP server can provide the _____ of the IP addresses.
   a) dynamic allocation b) automatic allocation
   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
   c) Ring d) Bus

9) In this topology there is a central controller or hub _____.
   a) Star b) Mesh
   c) Ring d) Bus

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

12) The address space of IPV4 is _____.
   a) 2^{32} b) 2^{16}
   c) 2^{8} d) None of these

13) The port number 1011 is _____ port number.
   a) registered b) well-known
   c) dynamic d) none of these

14) _____ is an example of connectionless simple protocol.
   a) IP b) TCP
   c) UDP d) None of these

Seat No.	

Set **Q**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Max. Marks: 56
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: **12**

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: **16**

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: **12**

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. **16**

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.

Seat No.	

Set **R**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 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

Duration: 30 Minutes Marks: 14

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

1) The address space of IPV4 is _____.
   a) 2^{32} b) 2^{16}
   c) 2^{8} d) None of these

2) The port number 1011 is _____ port number.
   a) registered b) well-known
   c) dynamic d) none of these

3) _____ is an example of connectionless simple protocol.
   a) IP b) TCP
   c) UDP d) None of these

4) Which protocol does Ping use?
   a) TCP b) ARP
   c) ICMP d) BootP

5) Which of the following devices is a PC component that connects the computer to the network?
   a) Bridge b) NIC
   c) DNS Server d) Gateway

6) To deliver a message to the correct application program running on a host, the _____ address must be consulted.
   a) IP b) MAC
   c) Port d) None of the above

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
   c) PTT d) None of the these

8) Mode of data transfer in FTP, using protocol is _____.
   a) Stream mode b) Block mode
   c) Compressed mode d) None of these

9) The DHCP server can provide the _____ of the IP addresses.
   a) dynamic allocation b) automatic allocation
   c) static allocation d) all of these

10) Header size of the ICMP message is _____.
   a) 8-bytes b) 8-bits
   c) 16-bytes d) 16-bits

11) The topology requires multipoint connection _____.
   a) Star b) Mesh
   c) Ring d) Bus

12) In this topology there is a central controller or hub _____.
   a) Star b) Mesh
   c) Ring d) Bus

13) The physical layer is responsible for moving _____ from one (node) to the next.
   a) segments b) Frames
   c) bits d) Datagram

14) Which one of the following task is not done by data link layer?
   a) framing b) error control
   c) flow control d) channel coding

Seat No.	

Set **R**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Max. Marks: 56
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: **12**

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: **16**

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: **12**

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. **16**

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.

Seat No.	

Set **S**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 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

Duration: 30 Minutes Marks: 14

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 b) MAC
   c) Port d) None of the above

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

3) Mode of data transfer in FTP, using protocol is _____.
   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

5) Header size of the ICMP message is _____.
   a) 8-bytes b) 8-bits
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6) The topology requires multipoint connection _____.
   a) Star b) Mesh
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9) Which one of the following task is not done by data link layer?
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   c) flow control d) channel coding

10) The address space of IPV4 is _____.
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   c) 2^{8} d) None of these

11) The port number 1011 is _____ port number.
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   c) dynamic d) none of these

12) _____ is an example of connectionless simple protocol.
   a) IP b) TCP
   c) UDP d) None of these

13) Which protocol does Ping use?
   a) TCP b) ARP
   c) ICMP d) BootP

14) Which of the following devices is a PC component that connects the computer to the network?
   a) Bridge b) NIC
   c) DNS Server d) Gateway

SLR-FM-266

Seat No.	

Set S

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
COMPUTER COMMUNICATION NETWORK

Day & Date: Saturday,07-12-2019 Max. Marks: 56
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: **12**

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: **16**

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: **12**

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. **16**

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.

Seat No.	

Set | P

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
VLSI 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 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 Marks: 14

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

1) Variables in VHDL can be used in _____.
   a) Process b) Procedure
   c) Function d) All of the above

2) The power dissipation of CMOS IC will _____.
   a) increase with frequency b) decrease with frequency
   c) both a and b d) none of these

3) 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

4) In VHDL which object is used to connect entities together for the model formation?
   a) Constant b) Variable
   c) Signal d) All of the above

5) For Complex gate design in CMOS, OR function needs to be implemented by _____.
   a) Series b) Parallel
   c) Both series and parallel d) None of the above

6) 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

7) 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

8) 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

9) The CPLD contains several PAL-type simple programmable logic devices (SPLDs) called _____.
   a) Macrocell b) Microcell
   c) AND/OR arrays d) Fuse-link arrays

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) SRAM
   b) Fuse
   c) both a and b
   d) none of these

14) In Moore circuits, the output depends on _____.
   a) Present state
   b) Present state and input
   c) Inputs
   d) None of these

Seat No.	

Set **P**

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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
VLSI DESIGN

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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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) 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

2) The CPLD contains several PAL-type simple programmable logic devices (SPLDs) called _____.
   a) Macrocell b) Microcell
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3) Propagation delay is more in _____ than _____.
   a) FPGA, CPLD b) CPLD, FPGA
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   a) 2N b) N+1
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b) remains constant
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d) none of the above

14) In concurrent code which of the statements can be used?
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b) Generate Statement
c) Block statement
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SLR-FM-267

Seat No.	

Set Q

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
VLSI DESIGN

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2) Calculate dynamic power dissipation in CMOS inverter when VDD= 3.3 V, C=10 pF, F=100 MHz.
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Section – II

Q.4 Answer any Four. **16**

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c) Draw state diagram and write VHDL code for ADD and SHIFT multiplier.

Seat No.	

Set R

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
VLSI DESIGN

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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   d) Verification

14) In VHDL which object is used to connect entities together for the model formation?
   a) Constant
   b) Variable
   c) Signal
   d) All of the above

Seat No.	

Set **R**

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

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Section – I

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e) Explain WAIT statements in VHDL.

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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.
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c) With example explain generic and generate statement in VHDL.

Section – II

Q.4 Answer any Four. **16**

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. **12**

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.

Seat No.	

Set **S**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
VLSI 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 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 Marks: 14

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

1) Propagation delay is more in _____ than _____.
   a) FPGA, CPLD b) CPLD, FPGA
   c) Can't say d) None of these

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   a) 72 b) 36
   c) 90 d) 18

3) To detect N bit sequence using Moore machine, the number of states required is _____.
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   c) N-1 d) 2N-1

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   a) SRAM b) Fuse
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a) Macrocell b) Microcell
c) AND/OR arrays d) Fuse-link arrays

SLR-FM-267

Seat No.	

Set S

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.
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Section – I

Q.2 Answer any Four. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **P**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3
2) Each question carries one mark.
3) 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) Calculate the radius of a circular orbit for which the period is 1 day?
   a) 42.241Km b) 42.241m
   c) 4.241Km d) 2.241Km

2) What is application of satellite systems?
   a) Whether forecasting b) Terrestrial communication
   c) Point to point communication d) None of the above

3) Atmospheric drag has negligible effect on _____.
   a) Geostationary satellites b) MEO
   c) LEO d) None of these

4) The down link frequency in the C band transponder is _____.
   a) 6 GHz b) 4 GHz
   c) 14 GHz d) 11 GHz

5) 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 b) 16dBw
   c) 48dBw d) None of above

6) 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 b) 80 m
   c) 20 m d) 4 m

7) Satellite receives signal from _____.
   a) Microwave repeater stations b) TV relay station
   c) Appropriate earth station d) All of the above

8) The Broadcast Satellite services (BSS) uses _____.
   a) One way Implementation b) Split Two- way Implementation
   c) Two-Way Implementation d) None of these

9) A satellite may carry _____ transponders.
   a) 32 b) 41
   c) 24 d) None of these

10) Which area is least effectively covered by geostationary satellites?
   a) Equatorial region b) Polar region
   c) a and b d) None of the above

11) _____ satellites will provide universal broadband Internet access.
   a) GPS b) Iridium
   c) Teledesic d) none of the above

12) A satellite earth station has _____.
   a) Receiving facilities only b) Transmitting only
   c) a and b d) a, c and attenuating

13) MATV stands for _____.
   a) Master antenna TV (MATV) b) Maximum Angular TV
   c) Multi amplitude TV d) None of these

14) The 24-MHz bandwidth of a transponder is capable of carrying _____.
   a) One analog television channel b) Two analog television channel
   c) Four analog television channel d) None of these

Seat No.	

Set **P**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

Instructions: 1) All questions are compulsory.
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Section - I

Q.2 Solve any Two: **14**
- **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: **14**
- **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: **14**
- **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: **14**
- **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.

Seat No.	

Set **Q**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
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SATELLITE COMMUNICATION

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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1) The Broadcast Satellite services (BSS) uses _____.
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8) Calculate the radius of a circular orbit for which the period is 1 day?
   a) 42.241Km b) 42.241m
   c) 4.241Km d) 2.241Km

9) What is application of satellite systems?
   a) Whether forecasting b) Terrestrial communication
   c) Point to point communication d) None of the above

10) Atmospheric drag has negligible effect on _____.
   a) Geostationary satellites b) MEO
   c) LEO d) None of these

11) The down link frequency in the C band transponder is _____.
   a) 6 GHz b) 4 GHz
   c) 14 GHz d) 11 GHz

12) 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 b) 16dBw
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13) 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 b) 80 m
   c) 20 m d) 4 m

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Seat No.	

Set **Q**

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Section - I

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Section - II

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Seat No.	

Set **R**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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   a) 6 GHz b) 4 GHz
   c) 14 GHz d) 11 GHz

Seat No.	

Set **R**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Max. Marks: 56
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: **14**
- **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: **14**
- **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: **14**
- **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: **14**
- **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.

Seat No.	

Set **S**

B.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3
2) Each question carries one mark.
3) 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) Which area is least effectively covered by geostationary satellites?
   a) Equatorial region b) Polar region
   c) a and b d) None of the above

2) _____ satellites will provide universal broadband Internet access.
   a) GPS b) Iridium
   c) Teledesic d) none of the above

3) A satellite earth station has _____.
   a) Receiving facilities only b) Transmitting only
   c) a and b d) a, c and attenuating

4) MATV stands for _____.
   a) Master antenna TV (MATV) b) Maximum Angular TV
   c) Multi amplitude TV d) None of these

5) The 24-MHz bandwidth of a transponder is capable of carrying _____.
   a) One analog television channel b) Two analog television channel
   c) Four analog television channel d) None of these

6) Calculate the radius of a circular orbit for which the period is 1 day?
   a) 42.241Km b) 42.241m
   c) 4.241Km d) 2.241Km

7) What is application of satellite systems?
   a) Whether forecasting b) Terrestrial communication
   c) Point to point communication d) None of the above

8) Atmospheric drag has negligible effect on _____.
   a) Geostationary satellites b) MEO
   c) LEO d) None of these

9) The down link frequency in the C band transponder is _____.
   a) 6 GHz b) 4 GHz
   c) 14 GHz d) 11 GHz

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 b) 16dBw
   c) 48dBw d) None of above

11) 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 b) 80 m
   c) 20 m d) 4 m

12) Satellite receives signal from _____.
   a) Microwave repeater stations b) TV relay station
   c) Appropriate earth station d) All of the above

13) The Broadcast Satellite services (BSS) uses _____.
   a) One way Implementation b) Split Two- way Implementation
   c) Two-Way Implementation d) None of these

14) A satellite may carry _____ transponders.
   a) 32 b) 41
   c) 24 d) None of these

Seat No.	

Set **S**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SATELLITE COMMUNICATION

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

Instructions: 1) All questions are compulsory.
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Section - I

Q.2 Solve any Two: **14**
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- **a)** Comment on R.F equipment for Earth station and Earth Station Testing.
- **b)** Explain Coverage & frequency consideration.
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Seat No.	

Set **P**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) The weight of code 1101101 is _____.
   a) 6 b) 5
   c) 4 d) 3

2) A box contains 4 white and 3 black balls. Three balls are drawn from the box successively. What is the probability that the first two balls are white and third is black?
   a) 5/35 b) 3/35
   c) 2/25 d) 6/35

3) The starting point on the code tree is at the _____ and corresponds to the situation before the arrival of the first message bit.
   a) extreme right b) extreme left
   c) middle d) none of these

4) The redundancy of (n,k) code is defined as _____.
   a) n / k b) k / n
   c) n-k / n d) n-k / k

5) For double error correction the minimum distance required is _____.
   a) 5 b) 4
   c) 3 d) 2

6) In convolution code encoder with a six stage shift register, the number of modulo-2 adders is 4. For an input data stream of 5 bits, the code word size will be _____.
   a) 68 b) 52
   c) 48 d) 44

7) The sequential decoding method is _____ times faster than the exhaustive method for k = 6.
   a) 128 b) 25
   c) 21 d) 12

8) 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

9) The total area under the probability distribution curve is _____.
   a) 1
   b) Depends on the nature of distribution
   c) 0
   d) None of the above

10) The convolutional encoder in terms of its _____, is the response of the encoder to a single one bit that moves through it.
   a) real time response b) response
   c) impulse response d) none of these

11) The stationary process has _____.
   a) Ensemble average equal to time average
   b) all the statistical properties dependent on time
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   d) zero variance

12) The tree diagram adds the dimensions of _____ to the state diagram.
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13) For each (k x n) generator matrix G, there exists an _____ matrix P.
   a) (n-k) x k b) k x n
   c) k x (n – k) d) (n – k) x n

14) A random variable that takes on a finite number of values is known as a _____.
   a) Continuous random variable b) Discrete random variable
   c) both a and b d) None of these

Seat No.	

Set **P**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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 **16**

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 **12**

a) The parity check matrix for (7,4) block code is given by

$$H = \begin{bmatrix} 1\,0\,1\,0\,1\,0\,0 \\ 1\,1\,0\,1\,0\,1\,0 \\ 1\,0\,1\,0\,0\,0\,1 \end{bmatrix}$$

Draw the decoder.

b) The joint probability function of two random variables X and Y is given by

$f(x,y) = c(x^2 + 2y) \quad x = 0,1,2, \quad y = 1,2,3,4$
$= 0 \qquad\qquad$ otherwise

Find:
1) Value of C
2) $P(X = 2, Y = 3)$
3) $P(X \leq 1, Y > 2)$

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 **16**

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.

Q.5 Attempt any two **12**

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.

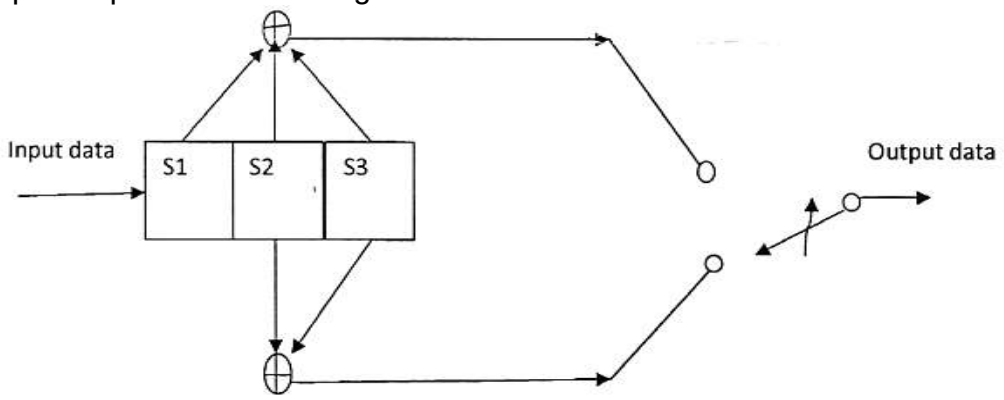

Fig 1

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

Seat No.	

Set **Q**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
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3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) 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

2) The total area under the probability distribution curve is _____.
   a) 1
   b) Depends on the nature of distribution
   c) 0
   d) None of the above

3) The convolutional encoder in terms of its _____, is the response of the encoder to a single one bit that moves through it.
   a) real time response b) response
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4) The stationary process has _____.
   a) Ensemble average equal to time average
   b) all the statistical properties dependent on time
   c) all the statistical properties independent on time
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5) The tree diagram adds the dimensions of _____ to the state diagram.
   a) Time b) Branches
   c) Direction d) Weight

6) For each (k x n) generator matrix G, there exists an _____ matrix P.
   a) (n-k) x k b) k x n
   c) k x (n – k) d) (n – k) x n

7) A random variable that takes on a finite number of values is known as a _____.
   a) Continuous random variable b) Discrete random variable
   c) both a and b d) None of these

8) The weight of code 1101101 is _____.
   a) 6 b) 5
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9) A box contains 4 white and 3 black balls. Three balls are drawn from the box successively. What is the probability that the first two balls are white and third is black?

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12) For double error correction the minimum distance required is _____.

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13) In convolution code encoder with a six stage shift register, the number of modulo-2 adders is 4. For an input data stream of 5 bits, the code word size will be _____.

a) 68 b) 52
c) 48 d) 44

14) The sequential decoding method is _____ times faster than the exhaustive method for k = 6.

a) 128 b) 25
c) 21 d) 12

Seat No.	

Set **Q**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
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Section – I

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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 **12**

a) The parity check matrix for (7,4) block code is given by

$$H = \begin{bmatrix} 1\,0\,1\,0\,1\,0\,0 \\ 1\,1\,0\,1\,0\,1\,0 \\ 1\,0\,1\,0\,0\,0\,1 \end{bmatrix}$$

Draw the decoder.

b) The joint probability function of two random variables X and Y is given by

$f(x,y) = c(x^2 + 2y) \quad x = 0,1,2, \quad y = 1,2,3,4$
$= 0 \qquad\qquad$ otherwise

Find:
1) Value of C
2) $P(X = 2, Y = 3)$
3) $P(X \leq 1, Y > 2)$

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 **16**

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.

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Q.5 Attempt any two **12**

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.

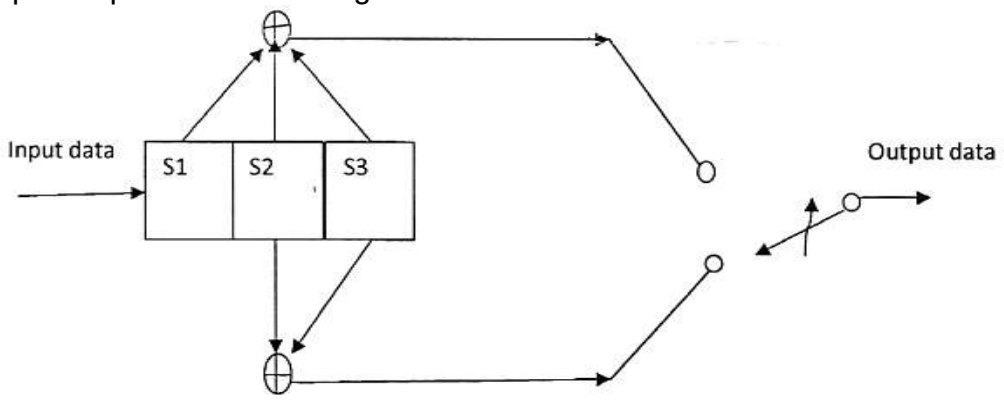

Fig 1

b) With example explain inpulse response representation technique to convolution coding.

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Seat No.	

Set **R**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) For double error correction the minimum distance required is _____.
   a) 5 b) 4
   c) 3 d) 2

2) In convolution code encoder with a six stage shift register, the number of modulo-2 adders is 4. For an input data stream of 5 bits, the code word size will be _____.
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   c) 48 d) 44

3) The sequential decoding method is _____ times faster than the exhaustive method for k = 6.
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Seat No.	

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B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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Section – I

Q.2 Attempt any four **16**

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.

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a) The parity check matrix for (7,4) block code is given by

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Draw the decoder.

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Section – II

Q.4 Attempt any four **16**

a) Explain different types of interleavers.

b) With suitable example, explain polynomial representation of convolution coding.

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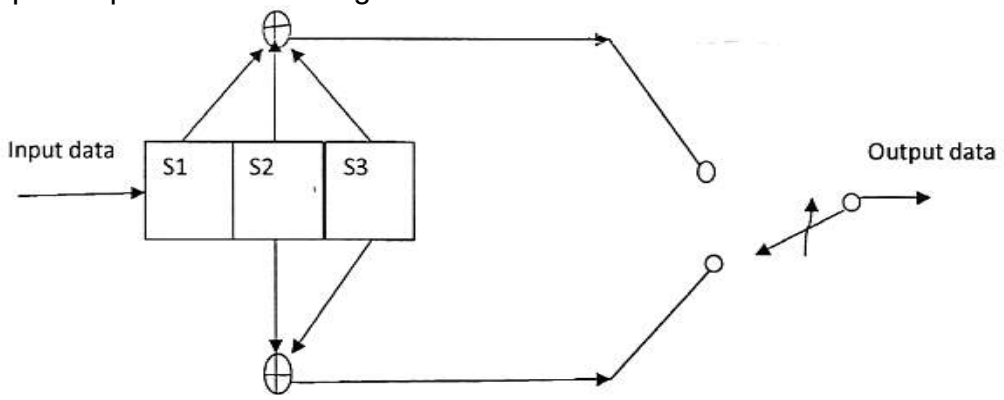

Fig 1

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Seat No.	

Set **S**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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Seat No.	

Set **S**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CODING THEORY

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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Section – I

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d) Explain in brief about turbo encoder.

e) Explain add – compare – select computation used in decoder implementation of convolutional decoder.

Q.5 Attempt any two **12**

a) For given convolutional encoder (Fig 1) construct code tree and find the output sequence for message 10010.

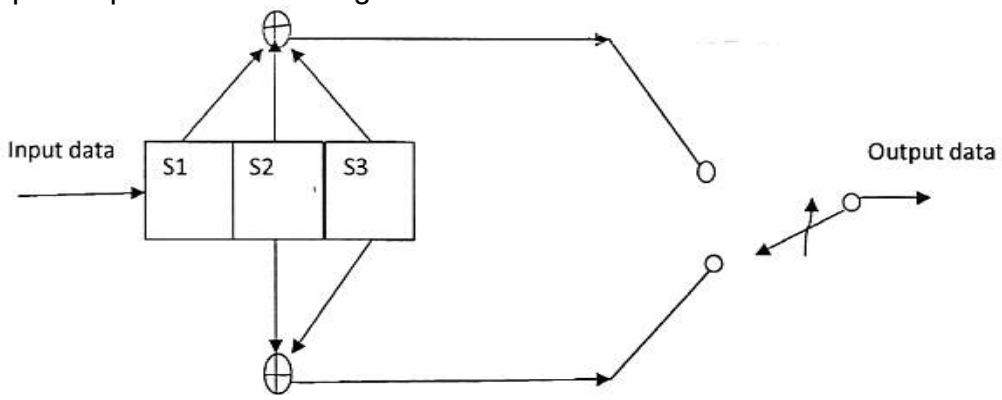

Fig 1

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

SLR-FM-271

Seat No.	

Set P

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. 14

1) D4 distance is called as _____.
   a) Euclidean distance b) City block distance
   c) Chess board distance d) None

2) 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) diagonal neighbors
   c) 8-neighbors d) None

3) CMYK color model is useful in _____.
   a) Display devices b) Printing applications
   c) Human color descriptor d) None

4) S = L-I-r, where s = *o/p* gray level and r = i/p gray level; means _____.
   a) Image negative b) Image positive
   c) Power law d) Log

5) Impulse noise is also called as _____.
   a) Salt and Paper noise b) Uniform noise
   c) Gaussian noise d) None

6) Expanding the object size is nothing but _____.
   a) Erosion b) Dilation
   c) Thinning d) None

7) 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

8) Which is the image processing technique used to improve the quality of image for human viewing?
   a) compression b) Enhancement
   c) restoration d) Analysis

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

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
   b) Compass
   c) Gradient
   d) None

14) JPEG is _____ standard.
   a) Still image coding
   b) Video coding
   c) Run-Length coding
   d) None

Seat No.	

Set **P**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE 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) Figures to the right indicates full marks.

SECTION I

Q.2 Attempt any Four: **14**

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: **14**

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: **14**

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. **14**

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.

Seat No.	

Set **Q**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Which is the image processing technique used to improve the quality of image for human viewing?
   a) compression b) Enhancement
   c) restoration d) Analysis

2) 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

3) Which device is used to capture the fingerprint pattern?
   a) Capture device b) Fingerprint sensor
   c) 2d sensor d) Digital sensor

4) Which of the following is a lossy coding?
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7) JPEG is _____ standard.
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8) D4 distance is called as _____.
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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 _____.
   a) 4-neighbors b) diagonal neighbors
   c) 8-neighbors d) None

10) CMYK color model is useful in _____.
   a) Display devices b) Printing applications
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11) 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

12) Impulse noise is also called as _____.
   a) Salt and Paper noise b) Uniform noise
   c) Gaussian noise d) None

13) Expanding the object size is nothing but _____.
   a) Erosion b) Dilation
   c) Thinning d) None

14) 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

Seat No.	

Set **Q**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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2) Figures to the right indicates full marks.

SECTION I

Q.2 Attempt any Four: **14**

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: **14**

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: **14**

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. **14**

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.

Seat No.	

Set **R**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Impulse noise is also called as _____.
   a) Salt and Paper noise b) Uniform noise
   c) Gaussian noise d) None

2) Expanding the object size is nothing but _____.
   a) Erosion b) Dilation
   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
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   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

5) 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

6) Which device is used to capture the fingerprint pattern?
   a) Capture device b) Fingerprint sensor
   c) 2d sensor d) Digital sensor

7) Which of the following is a lossy coding?
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   b) Run-length code
   c) Uniform code
   d) Predictive coding without quantiser

8) The transform used in JPEG image Compression is _____.
   a) DCT b) Walsh
   c) DFT d) Harr

9) First order derivative operator is also called as _____.
   a) Laplacian b) Compass
   c) Gradient d) None

10) JPEG is _____ standard.
   a) Still image coding b) Video coding
   c) Run-Length coding d) None

11) D4 distance is called as _____.
   a) Euclidean distance b) City block distance
   c) Chess board distance d) None

12) 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) 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.	

Set **R**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
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: **14**

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: **14**

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: **14**

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. **14**

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.

Seat No.	

Set **S**

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Which device is used to capture the fingerprint pattern?
   a) Capture device b) Fingerprint sensor
   c) 2d sensor d) Digital sensor

2) Which of the following is a lossy coding?
   a) Huffman code
   b) Run-length code
   c) Uniform code
   d) Predictive coding without quantiser

3) The transform used in JPEG image Compression is _____.
   a) DCT b) Walsh
   c) DFT d) Harr

4) First order derivative operator is also called as _____.
   a) Laplacian b) Compass
   c) Gradient d) None

5) JPEG is _____ standard.
   a) Still image coding b) Video coding
   c) Run-Length coding d) None

6) D4 distance is called as _____.
   a) Euclidean distance b) City block distance
   c) Chess board distance d) None

7) 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 _____.
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13) Which is the image processing technique used to improve the quality of image for human viewing?
   a) compression b) Enhancement
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14) 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

Seat No.	

Set S

B.E. (Part -I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
IMAGE PROCESSING

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
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: **14**

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: **14**

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: **14**

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.

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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.

Seat No.	

Set P

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) 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

2) The linear filtering operation followed by down sampling on x(n) is not time invariant.
   a) True b) False

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

4) 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

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

7) Power spectrum describes distribution of _____ under frequency domain.
   a) Mean b) Variance
   c) Gaussian d) None of the mentioned

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

10) Autocorrelation function of white noise will have?
   a) Strong peak
   b) Infinite peak
   c) Weak peak
   d) None of the mentioned

11) Rate of convergence is defined by _____ of algorithm.
   a) Time span
   b) Number of iterations
   c) Accuracy
   d) Complexity

12) Computational complexity is a measure of _____.
   a) Time
   b) Number of iterations
   c) Number of operations
   d) Accuracy

13) 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

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

Seat No.	

Set **P**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set | Q

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) 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

2) 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

3) Autocorrelation function of white noise will have?
   a) Strong peak b) Infinite peak
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4) Rate of convergence is defined by _____ of algorithm.
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   a) Z-plane to S-plane b) S-plane to Z-plane
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8) To what value should the bandwidth of x(n) has to be reduced in order to avoid aliasing?
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13) Power spectral density function is a _____.
   a) Real and even function
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   c) Periodic
   d) All of the mentioned

14) Power spectrum describes distribution of _____ under frequency domain.
   a) Mean
   b) Variance
   c) Gaussian
   d) None of the mentioned

Seat No.	

Set **Q**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt any two. **14**

a) Design an ideal low pass filter with a frequency response.
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$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set R

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. 14

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   a) Signal distortion
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5) 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

6) Autocorrelation function of white noise will have?
   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
   c) Accuracy d) Complexity

8) Computational complexity is a measure of _____.
   a) Time b) Number of iterations
   c) Number of operations d) Accuracy

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

Seat No.	

Set **R**

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

Seat No.	

Set | S

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the options. **14**

1) Autocorrelation function of white noise will have?
   a) Strong peak b) Infinite peak
   c) Weak peak d) None of the mentioned

2) Rate of convergence is defined by _____ of algorithm.
   a) Time span b) Number of iterations
   c) Accuracy d) Complexity

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 b) S-plane to Z-plane
   c) S-plane to J-plane d) J-plane to Z-plane

6) 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

7) The linear filtering operation followed by down sampling on x(n) is not time invariant.
   a) True b) False

8) Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?
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   c) Convolution d) None of the mentioned

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

13) 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

SLR-FM-272

Seat No.		Set	S

B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ADVANCED DSP

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
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. **14**

a) Design an ideal low pass filter with a frequency response.
$H_d(e^{jw}) = 1$ for $0 \leq |w| \leq \pi/4$
$= 0\ otherwise$
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. **14**

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. **14**

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. **14**

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.

SLR-FM-273

Seat No.	

Set P

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) User data is transferred in which of the frame mode protocol.
   a) LAPF control b) LAPF core
   c) Circuit switching d) None

2) Basic access means _____.
   a) 30B+1D b) 2B+1D
   c) both a&b d) None

3) The main data channel for ordinary ISDN user is _____.
   a) B channel b) D channel
   c) H channel d) None

4) X.25 is standard for _____.
   a) Frame relay b) Packet switching
   c) both a&b d) None

5) ISDN relies on standard voice data rate of _____.
   a) 192Kbps b) 64Kbps
   c) 1.5Mbps d) None

6) Which of the following is faster but unreliable protocol?
   a) Frame relay b) Packet switching
   c) Circuit switching d) None

7) Modulation-demodulation is required at every hop of a network using _____.
   a) Bridge b) Analog switch
   c) Digital switch d) None

8) CMI means _____coding.
   a) Coded marked inversion b) Cell mark integration
   c) Coding mark integration d) None

9) VPI is _____ bits at the user network interface.
   a) 4 b) 8
   c) 12 d) 16

10) In the SYNC state, the _____is used for error detection and correction.
   a) HUNT b) Pre sync
   c) HEC d) DLCI

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
   c) 3 d) 4

13) 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

14) Which traffic type is used by internet access?
   a) CBR b) VBR
   c) ABR d) UBR

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set | Q |

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) CMI means _____coding.
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2) VPI is _____ bits at the user network interface.
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   a) LAPF control b) LAPF core
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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 channel b) D channel
   c) H channel d) None

11) X.25 is standard for _____.
   a) Frame relay b) Packet switching
   c) both a&b d) None

12) ISDN relies on standard voice data rate of _____.
   a) 192Kbps b) 64Kbps
   c) 1.5Mbps d) None

13) Which of the following is faster but unreliable protocol?
   a) Frame relay b) Packet switching
   c) Circuit switching d) None

14) Modulation-demodulation is required at every hop of a network using _____.
   a) Bridge b) Analog switch
   c) Digital switch d) None

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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. **16**

a) Explain packet switching along with datagram and virtual circuit approach.
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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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set | R

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) ISDN relies on standard voice data rate of _____.
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   a) Frame relay b) Packet switching
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Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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. **16**

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.

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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. **16**

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. **12**

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.

SLR-FM-273

Seat No.	

Set S

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

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 the SYNC state, the _____is used for error detection and correction.
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   c) HEC d) DLCI

2) Email is an example of _____service.
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   a) 192Kbps b) 64Kbps
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   d) None

13) CMI means _____coding.
   a) Coded marked inversion
   b) Cell mark integration
   c) Coding mark integration
   d) None

14) VPI is _____ bits at the user network interface.
   a) 4
   b) 8
   c) 12
   d) 16

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics &Telecommunication Engineering
BROAD BAND COMMUNICATION

Day & Date: Friday, 22-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

a) Explain AAL type I Protocol for ATM.
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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. **12**

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.

SLR-FM-274

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: 70
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 Marks: 14

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

1) The number of lines scanned per frame in the raster on the picture tube 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

3) How many H lines are there in each field?
   a) 8 ½ lines b) 10 ½ lines
   c) 262 ½ lines d) 325 lines

4) How many H lines are there in each V retrace?
   a) one b) two
   c) three d) four

5) 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

6) The color with the most luminance is _____.
   a) Red b) Yellow
   c) Green d) Blue

7) The aspect ratio HDTV is _____.
   a) 4:3 b) 18:5
   c) 14:8 d) 16:9

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 d) none of the above

9) _____ is the protocol designed to handle real-time traffic on the Internet.
   a) TCP b) UDP
   c) RTP d) none of the above.

10) 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

11) We can divide audio and video services into _____ broad categories.
   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
   c) Interactive d) None of the above

13) A _____ adds signals from different sources to create a single signal.
   a) Timestamp b) Sequence number
   c) Mixer d) None of the above

14) 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

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.

Q.2 Attempt any four of the following questions. **16**

a) Compare Compact and Conventional Discs.
b) Explain TV transmitter block diagrams.
c) Write Note on:
i) Luminance signal
ii) Chrominance signal
d) With neat block diagram explain Video IF amplifier.
e) Write short note on High Definition TV.

Q.3 Attempt any two of the following questions. **12**

a) Briefly explain Principle of disc recording and reproduction.
b) Write short note on NTSC, SECAM and PAL colour TV systems.
c) With neat block diagram explain colour burst circuit.

Q.4 Attempt any four of the following questions. **16**

a) What is need of multimedia? Discuss advantages of it.
b) Which are the elements of multimedia system?
c) Write note on broadband multiservice networks.
d) Explain audio compression.
e) What is the need of compression? Explain any one technique of image compression.

Q.5 Attempt any two of the following questions. **12**

a) Enlist and explain multimedia application.
b) Write short note on multimedia networks.
c) Compare MPEG-1, MPEG-2, and MPEG-4.

Seat No.	

Set **Q**

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it 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) _____ 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

2) _____ is the protocol designed to handle real-time traffic on the Internet.
   a) TCP b) UDP
   c) RTP d) none of the above.

3) 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

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.
   a) Streaming live b) Streaming stored
   c) Interactive d) None of the above

6) A _____ adds signals from different sources to create a single signal.
   a) Timestamp b) Sequence number
   c) Mixer d) None of the above

7) 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

8) The number of lines scanned per frame in the raster on the picture tube screen is____.
   a) 525 b) 262
   c) 20 d) 10

9) 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

Seat No.	

Set **Q**

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.

Q.2 Attempt any four of the following questions. **16**

a) Compare Compact and Conventional Discs.
b) Explain TV transmitter block diagrams.
c) Write Note on:
i) Luminance signal
ii) Chrominance signal
d) With neat block diagram explain Video IF amplifier.
e) Write short note on High Definition TV.

Q.3 Attempt any two of the following questions. **12**

a) Briefly explain Principle of disc recording and reproduction.
b) Write short note on NTSC, SECAM and PAL colour TV systems.
c) With neat block diagram explain colour burst circuit.

Q.4 Attempt any four of the following questions. **16**

a) What is need of multimedia? Discuss advantages of it.
b) Which are the elements of multimedia system?
c) Write note on broadband multiservice networks.
d) Explain audio compression.
e) What is the need of compression? Explain any one technique of image compression.

Q.5 Attempt any two of the following questions. **12**

a) Enlist and explain multimedia application.
b) Write short note on multimedia networks.
c) Compare MPEG-1, MPEG-2, and MPEG-4.

Seat No.	

Set **R**

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and 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 Marks: 14

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 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) three b) two
   c) four d) 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) Timestamp b) Sequence number
   c) Mixer d) None of the above

10) 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

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

Seat No.	

Set **R**

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.

Q.2 Attempt any four of the following questions. **16**

a) Compare Compact and Conventional Discs.
b) Explain TV transmitter block diagrams.
c) Write Note on:
i) Luminance signal
ii) Chrominance signal
d) With neat block diagram explain Video IF amplifier.
e) Write short note on High Definition TV.

Q.3 Attempt any two of the following questions. **12**

a) Briefly explain Principle of disc recording and reproduction.
b) Write short note on NTSC, SECAM and PAL colour TV systems.
c) With neat block diagram explain colour burst circuit.

Q.4 Attempt any four of the following questions. **16**

a) What is need of multimedia? Discuss advantages of it.
b) Which are the elements of multimedia system?
c) Write note on broadband multiservice networks.
d) Explain audio compression.
e) What is the need of compression? Explain any one technique of image compression.

Q.5 Attempt any two of the following questions. **12**

a) Enlist and explain multimedia application.
b) Write short note on multimedia networks.
c) Compare MPEG-1, MPEG-2, and MPEG-4.

Seat No.	

Set **S**

B.E. (Part - II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MULTIMEDIA COMMUNICATION TECHNIQUES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and 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 Marks: 14

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

1) 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

2) We can divide audio and video services into _____ broad categories.
   a) three b) two
   c) four d) none of the above

3) _____ 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

4) A _____ adds signals from different sources to create a single signal.
   a) Timestamp b) Sequence number
   c) Mixer d) None of the above

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
   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

8) How many H lines are there in each field?
   a) 8 ½ lines b) 10 ½ lines
   c) 262 ½ lines d) 325 lines

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
   c) 14:8 d) 16:9

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 b) UDP
   c) RTP d) none of the above.

SLR-FM-274

Seat No.	

Set S

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.

Q.2 Attempt any four of the following questions. **16**

a) Compare Compact and Conventional Discs.
b) Explain TV transmitter block diagrams.
c) Write Note on:
i) Luminance signal
ii) Chrominance signal
d) With neat block diagram explain Video IF amplifier.
e) Write short note on High Definition TV.

Q.3 Attempt any two of the following questions. **12**

a) Briefly explain Principle of disc recording and reproduction.
b) Write short note on NTSC, SECAM and PAL colour TV systems.
c) With neat block diagram explain colour burst circuit.

Q.4 Attempt any four of the following questions. **16**

a) What is need of multimedia? Discuss advantages of it.
b) Which are the elements of multimedia system?
c) Write note on broadband multiservice networks.
d) Explain audio compression.
e) What is the need of compression? Explain any one technique of image compression.

Q.5 Attempt any two of the following questions. **12**

a) Enlist and explain multimedia application.
b) Write short note on multimedia networks.
c) Compare MPEG-1, MPEG-2, and MPEG-4.

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 70
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 Marks: 14

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 r14
   c) In the program counter pc d) None of these

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 cpsr b) Full read write access to cpsr
   c) Full write access to cpsr d) 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

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) 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 _____.
   a) Stack
   b) Translation look aside buffer
   c) Task control block
   d) Task

13) Which type of following OS the response time is critical?
   a) Network operating System
   b) Real Time operating System
   c) Batch OS
   d) Unix operating system

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

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

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
   c) Commands d) Scripts

4) Race around condition can be avoided by using _____.
   a) Semaphore b) Mutex
   c) Socket d) both a and b

5) Information about a task is maintained in a _____.
   a) Stack b) Translation look aside buffer
   c) Task control block d) Task

6) Which type of following OS the response time is critical?
   a) Network operating System b) Real Time operating System
   c) Batch OS d) Unix operating system

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
   d) Production of the result of a task within a certain stipulated time period

8) 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 r14
   c) In the program counter pc
   d) None of these

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

10) ARM uses the thumb_____ bit instruction set to improve code density.
   a) 32
   b) 8
   c) 64
   d) 16

11) 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

12) 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

13) Which of the following instructions are called Program Status Register transfer instructions?
   a) LDR, STR
   b) LDM, STM
   c) MCR, MRC
   d) MSR, MRS

14) A privileged mode allows _____.
   a) Full read access to cpsr
   b) Full read write access to cpsr
   c) Full write access to cpsr
   d) Full read write access to spsr

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) Which of the following instructions are called Program Status Register transfer instructions?
   a) LDR, STR b) LDM, STM
   c) MCR, MRC d) MSR, MRS

3) A privileged mode allows _____.
   a) Full read access to cpsr b) Full read write access to cpsr
   c) Full write access to cpsr d) Full read write access to spsr

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 b) Context switch
   c) Time sharing d) None of above

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?
   a) shell b) Kernel
   c) Commands d) Scripts

7) Race around condition can be avoided by using _____.
   a) Semaphore b) Mutex
   c) Socket d) both a and b

8) Information about a task is maintained in a _____.
   a) Stack b) Translation look aside buffer
   c) Task control block d) Task

9) Which type of following OS the response time is critical?
   a) Network operating System
   b) Real Time operating System
   c) Batch OS
   d) Unix operating system

10) Which one of the following is an important objective of a real-time operating system?
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11) Where is the return address stored after execution of the Branch-and-Link (BL) instruction in ARM?
   a) In the stack
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13) ARM uses the thumb_____ bit instruction set to improve code density.
   a) 32
   b) 8
   c) 64
   d) 16

14) 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

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

a) List features of UCOSII RTOs.

b) Write an embedded C code to demonstrate operation of on-chip DAC of LPC2148.

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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?

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a) With suitable example explain the role of semaphore in Operating system.

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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.

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 70
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 Marks: 14

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

1) Which is the core of the OS?
   a) shell b) Kernel
   c) Commands d) Scripts

2) Race around condition can be avoided by using _____.
   a) Semaphore b) Mutex
   c) Socket d) both a and b

3) Information about a task is maintained in a _____.
   a) Stack b) Translation look aside buffer
   c) Task control block d) Task

4) Which type of following OS the response time is critical?
   a) Network operating System b) Real Time operating System
   c) Batch OS d) Unix operating system

5) 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

6) 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 r14
   c) In the program counter pc d) None of these

7) 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

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?
   a) LDR, STR b) LDM, STM
   c) MCR, MRC d) MSR, MRS

12) A privileged mode allows _____.
   a) Full read access to cpsr b) Full read write access to cpsr
   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

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
EMBEDDED SYSTEMS

Day & Date: Monday,25-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) _____ routes user queries or commands to appropriate nodes in sensor.
   a) bridge b) gateway
   c) Node d) None of these

2) _____ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
   a) sensor b) sensor node
   c) routing d) none of the above

3) ____ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node use.
   a) Contention b) Schedule
   c) RFID d) None of the above

4) LEACH is example of _____.
   a) Contention b) Schedule
   c) RFID d) None of the above

5) 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

6) In wireless adhoc network _____.
   a) access point is not required b) access point is required
   c) nodes are not required d) none of the above

7) Clustering in WSN contribute to _____.
   a) System scalability b) Life time
   c) Energy efficiency d) All of above

8) In WSNs, _____ mobility is viewed.
   a) Node b) Sink
   c) Event d) All of the above

9) RFID stands for _____.
   a) Radio Frequency Identification b) Radio first identification
   c) both a)&b) d) None of above

10) _____ 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

11) Performance of time synchronization protocol is closely related with _____.
a) network topology b) power
c) frames d) none of the above

12) _____ MAC protocol is widely used in modern cellular communication systems.
a) TDMA b) FDMA
c) CDMA 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 b) Health-care
c) Massive incidents d) All of the above

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) In WSNs, _____ mobility is viewed.
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   c) Event d) All of the above

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   a) Radio Frequency Identification b) Radio first identification
   c) both a)&b) d) None of above

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   a) Energy efficiency b) Power consumption
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7) _____ is the application of RFID.
   a) Identification and data capture b) Health-care
   c) Massive incidents d) All of the above

8) _____ routes user queries or commands to appropriate nodes in sensor.
   a) bridge b) gateway
   c) Node 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
   c) routing d) none of the above

10) ____ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node use.
   a) Contention b) Schedule
   c) RFID d) None of the above

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) access point is required
   c) nodes are not required d) none of the above

14) Clustering in WSN contribute to _____.
   a) System scalability b) Life time
   c) Energy efficiency d) All of above

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) 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

2) In wireless adhoc network _____.
   a) access point is not required b) access point is required
   c) nodes are not required d) none of the above

3) Clustering in WSN contribute to _____.
   a) System scalability b) Life time
   c) Energy efficiency d) All of above

4) In WSNs, _____ mobility is viewed.
   a) Node b) Sink
   c) Event d) All of the above

5) RFID stands for _____.
   a) Radio Frequency Identification b) Radio first identification
   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 b) power
   c) frames d) none of the above

8) _____ MAC protocol is widely used in modern cellular communication systems.
   a) TDMA b) FDMA
   c) CDMA d) All of the above

9) _____ 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

10) _____ is the application of RFID.
a) Identification and data capture b) Health-care
c) Massive incidents d) All of the above

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12) _____ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
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c) routing d) none of the above

13) ____ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node use.
a) Contention b) Schedule
c) RFID d) None of the above

14) LEACH is example of _____.
a) Contention b) Schedule
c) RFID d) None of the above

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) _____ 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

2) Performance of time synchronization protocol is closely related with _____.
   a) network topology b) power
   c) frames d) none of the above

3) _____ MAC protocol is widely used in modern cellular communication systems.
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   c) CDMA d) All of the above

4) _____ 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

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   a) Identification and data capture b) Health-care
   c) Massive incidents d) All of the above

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7) _____ is a basic unit with on board sensors, processor, memory, wireless modem and power supply.
   a) sensor b) sensor node
   c) routing d) none of the above

8) ____ based protocol do not divide channel into sub-channels or pre-allocate the channel for each node use.
   a) Contention b) Schedule
   c) RFID d) None of the above

9) LEACH is example of _____.
   a) Contention b) Schedule
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10) Main role of time synchronization in distributed networks is to _____.
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13) In WSNs, _____ mobility is viewed.
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   c) Event d) All of the above

14) RFID stands for _____.
   a) Radio Frequency Identification b) Radio first identification
   c) both a)&b) d) None of above

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
WIRELESS SENSOR NETWORK

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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.

SLR-FM-277

Seat No.	

Set P

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION

Day & Date: Tuesday,26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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**

1) In _____ learning number of classes are known.
   a) Unsupervised b) Supervised
   c) Both of these d) None of these

2) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor b) Bayesian estimation
   c) Parzen window d) All of the above

3) Determining sequence of hidden states for given HMM and visible states is called
   a) Evaluation problem b) Decoding problem
   c) Learning problem d) All of these

4) Production rules represent a wide variety of knowledge representations that are based on_____
   a) Condition only b) Action only
   c) condition-action pairs d) None of these

5) Triangle Inequality property of distance metric is given as
   a) $\mathrm{D}(\mathrm{a},\mathrm{b}) + \mathrm{D}(\mathrm{b},\mathrm{c}) \geq \mathrm{D}(\mathrm{a},\mathrm{c})$ b) $\mathrm{D}(\mathrm{a},\mathrm{b}) \geq 0$
   c) $\mathrm{D}(\mathrm{a},\mathrm{b}) = \mathrm{D}(\mathrm{b},\mathrm{a})$ d) None of these

6) In Statistical pattern recognition, the block 'Construction of formal description' is based on
   a) The experience of the designer
   b) Intuition of the designer
   c) Both a and b
   d) Neither a and b

7) A random variable that takes on an infinite number of values is known as a_____
   a) Independent random variable b) Discrete random variable
   c) Continuous random variable d) None of the above

8) Our productions of any sequence is described by the transition probabilities_____

a) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right) = b_{ij}$ b) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right) = b_{jk}$

c) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right) = a_{ij}$ d) $P\left(v_k(t)\middle|\omega_j(t)\right) = b_{jk}$

9) Parzen-window classifier depends upon the choice of

a) No. of sample points b) Window function

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

10) Wards method is also named as the_____ Method.

a) Maximum of squared variance b) Minimum of squared variance

c) Maximum Variance d) Minimum Variance

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

12) Classifier that places a pattern in one of only two categories is called

a) Chotomizer b) Trichomizer

c) Economizer d) Dichotomizer

13) Syntactic Recognition Algorithm consists of following steps_____

a) Learning, Recognition, Classification

b) Learning, Construct a description grammar, Recognition, Classification

c) Construct a description grammar, Recognition, Classification

d) Learning, Construct a description grammar, Classification

14) The loss function $\lambda(\alpha_i|w_j)$ describes the loss incurred for taking action α_i when the state of the nature is w_j has value equal to _____.

a) 0 when $i = j$ b) 2 when $i = j$

c) 1 when $i = j$ d) 0 when $i \neq j$

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION (Elective – II)

Day & Date: Tuesday,26-11-2019 Max. Marks: 56
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 **12**

a) Suppose that the Random variables X & Y have the joint density function defined by $f(x,y) = c(2x+y) \quad 2 < x < 6 \ \& 0 < y < 5$
$= 0 \quad otherwise$
Find : 1) constant c, 2) $P(X > 3, Y > 2)$

b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where μ is unknown and covariance matrix (Σ) 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. **16**

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
$f(x,y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$
$= 0 \quad , \ otherwise$
Find :
1) the value of c 2) marginal probability functions of X & Y
3) 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. **12**

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. **16**

a) Explain fuzzy Optimization technique in recognition.

b) Write a note on Neural Networks.

c) Starting from fundamentals derive an expression for density estimation
$P_n(x) = \frac{K_n/n}{V_n}$

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION

Day & Date: Tuesday,26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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**

1) Our productions of any sequence is described by the transition probabilities_____
   a) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right) = b_{ij}$ b) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right) = b_{jk}$
   c) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right) = a_{ij}$ d) $P\left(v_k(t)\middle|\omega_j(t)\right) = b_{jk}$

2) Parzen-window classifier depends upon the choice of
   a) No. of sample points b) Window function
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3) Wards method is also named as the_____ Method.
   a) Maximum of squared variance b) Minimum of squared variance
   c) Maximum Variance d) Minimum Variance

4) 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

5) Classifier that places a pattern in one of only two categories is called
   a) Chotomizer b) Trichomizer
   c) Economizer d) Dichotomizer

6) Syntactic Recognition Algorithm consists of following steps_____
   a) Learning, Recognition, Classification
   b) Learning, Construct a description grammar, Recognition, Classification
   c) Construct a description grammar, Recognition, Classification
   d) Learning, Construct a description grammar, Classification

7) The loss function $\lambda(\alpha_i|w_j)$ describes the loss incurred for taking action α_i when the state of the nature is w_j has value equal to _____.
   a) 0 when $i = j$ b) 2 when $i = j$
   c) 1 when $i = j$ d) 0 when $i \neq j$

8) In _____ learning number of classes are known.
   a) Unsupervised b) Supervised
   c) Both of these d) None of these

9) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor
   b) Bayesian estimation
   c) Parzen window
   d) All of the above

10) Determining sequence of hidden states for given HMM and visible states is called
   a) Evaluation problem
   b) Decoding problem
   c) Learning problem
   d) All of these

11) Production rules represent a wide variety of knowledge representations that are based on_____
   a) Condition only
   b) Action only
   c) condition-action pairs
   d) None of these

12) Triangle Inequality property of distance metric is given as
   a) $\mathrm{D}(\mathrm{a},\mathrm{b}) + \mathrm{D}(\mathrm{b},\mathrm{c}) \geq \mathrm{D}(\mathrm{a},\mathrm{c})$
   b) $\mathrm{D}(\mathrm{a},\mathrm{b}) \geq 0$
   c) $\mathrm{D}(\mathrm{a},\mathrm{b}) = \mathrm{D}(\mathrm{b},\mathrm{a})$
   d) None of these

13) In Statistical pattern recognition, the block 'Construction of formal description' is based on
   a) The experience of the designer
   b) Intuition of the designer
   c) Both a and b
   d) Neither a and b

14) A random variable that takes on an infinite number of values is known as a_____
   a) Independent random variable
   b) Discrete random variable
   c) Continuous random variable
   d) None of the above

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION (Elective – II)

Day & Date: Tuesday,26-11-2019 Max. Marks: 56
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 **12**

a) Suppose that the Random variables X & Y have the joint density function defined by $f(x,y) = c(2x+y) \quad 2 < x < 6 \ \& 0 < y < 5$
$= 0 \quad otherwise$
Find : 1) constant c, 2) $P(X > 3, Y > 2)$

b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where μ is unknown and covariance matrix (Σ) 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. **16**

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
$f(x,y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$
$= 0 \quad , \ otherwise$
Find :
1) the value of c 2) marginal probability functions of X & Y
3) 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. **12**

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. **16**

a) Explain fuzzy Optimization technique in recognition.

b) Write a note on Neural Networks.

c) Starting from fundamentals derive an expression for density estimation
$P_n(x) = \frac{K_n/n}{V_n}$

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION

Day & Date: Tuesday,26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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**

1) Triangle Inequality property of distance metric is given as
   a) $D(a,b)+D(b,c)\geq D(a,c)$ b) $D(a,b)\geq 0$
   c) $D(a,b)=D(b,a)$ d) None of these

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
   c) Both a and b
   d) Neither a and b

3) A random variable that takes on an infinite number of values is known as a_____
   a) Independent random variable b) Discrete random variable
   c) Continuous random variable d) None of the above

4) Our productions of any sequence is described by the transition probabilities_____
   a) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right)=b_{ij}$ b) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right)=b_{jk}$
   c) $P\left(\omega_j(t+1)\middle|\omega_i(t)\right)=a_{ij}$ d) $P\left(v_k(t)\middle|\omega_j(t)\right)=b_{jk}$

5) Parzen-window classifier depends upon the choice of
   a) No. of sample points b) Window function
   c) Both a and b d) None of the above

6) Wards method is also named as the_____ Method.
   a) Maximum of squared variance b) Minimum of squared variance
   c) Maximum Variance d) Minimum Variance

7) 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

8) Classifier that places a pattern in one of only two categories is called
   a) Chotomizer b) Trichomizer
   c) Economizer d) Dichotomizer

9) Syntactic Recognition Algorithm consists of following steps_____
   a) Learning, Recognition, Classification
   b) Learning, Construct a description grammar, Recognition, Classification
   c) Construct a description grammar, Recognition, Classification
   d) Learning, Construct a description grammar, Classification

10) The loss function $\lambda(\alpha_i|w_j)$ describes the loss incurred for taking action α_i when the state of the nature is w_j has value equal to _____.
   a) 0 when $i = j$
   b) 2 when $i = j$
   c) 1 when $i = j$
   d) 0 when $i \neq j$

11) In _____ learning number of classes are known.
   a) Unsupervised
   b) Supervised
   c) Both of these
   d) None of these

12) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor
   b) Bayesian estimation
   c) Parzen window
   d) All of the above

13) Determining sequence of hidden states for given HMM and visible states is called
   a) Evaluation problem
   b) Decoding problem
   c) Learning problem
   d) All of these

14) Production rules represent a wide variety of knowledge representations that are based on_____
   a) Condition only
   b) Action only
   c) condition-action pairs
   d) None of these

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION (Elective – II)

Day & Date: Tuesday,26-11-2019 Max. Marks: 56
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 **12**

a) Suppose that the Random variables X & Y have the joint density function defined by $f(x,y) = c(2x+y) \quad 2 < x < 6 \;\; \& 0 < y < 5$
$= 0 \quad otherwise$
Find : 1) constant c, 2) $P(X > 3, Y > 2)$

b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where μ is unknown and covariance matrix (Σ) 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. **16**

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
$f(x,y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$
$= 0 \quad , \; otherwise$
Find :
1) the value of c 2) marginal probability functions of X & Y
3) 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. **12**

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. **16**

a) Explain fuzzy Optimization technique in recognition.

b) Write a note on Neural Networks.

c) Starting from fundamentals derive an expression for density estimation
$P_n(x) = \frac{K_n/n}{V_n}$

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION

Day & Date: Tuesday,26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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**

1) Wards method is also named as the_____ Method.
   a) Maximum of squared variance b) Minimum of squared variance
   c) Maximum Variance d) Minimum Variance

2) 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

3) Classifier that places a pattern in one of only two categories is called
   a) Chotomizer b) Trichomizer
   c) Economizer d) Dichotomizer

4) Syntactic Recognition Algorithm consists of following steps_____
   a) Learning, Recognition, Classification
   b) Learning, Construct a description grammar, Recognition, Classification
   c) Construct a description grammar, Recognition, Classification
   d) Learning, Construct a description grammar, Classification

5) The loss function $\lambda(\alpha_i|w_j)$ describes the loss incurred for taking action α_i when the state of the nature is w_j has value equal to _____.
   a) 0 when $i = j$ b) 2 when $i = j$
   c) 1 when $i = j$ d) 0 when $i \neq j$

6) In _____ learning number of classes are known.
   a) Unsupervised b) Supervised
   c) Both of these d) None of these

7) The density estimation in which the volume V_n is shrinked according to function $V_n = \frac{1}{\sqrt{n}}$ is called
   a) Kn-nearest neighbor b) Bayesian estimation
   c) Parzen window d) All of the above

8) Determining sequence of hidden states for given HMM and visible states is called
   a) Evaluation problem b) Decoding problem
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9) Production rules represent a wide variety of knowledge representations that are based on_____
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   d) None of these

10) Triangle Inequality property of distance metric is given as
   a) $\mathrm{D}(\mathrm{a},\mathrm{b}) + \mathrm{D}(\mathrm{b},\mathrm{c}) \geq \mathrm{D}(\mathrm{a},\mathrm{c})$
   b) $\mathrm{D}(\mathrm{a},\mathrm{b}) \geq 0$
   c) $\mathrm{D}(\mathrm{a},\mathrm{b}) = \mathrm{D}(\mathrm{b},\mathrm{a})$
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11) In Statistical pattern recognition, the block 'Construction of formal description' is based on
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   b) Intuition of the designer
   c) Both a and b
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12) A random variable that takes on an infinite number of values is known as a_____
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   b) Discrete random variable
   c) Continuous random variable
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13) Our productions of any sequence is described by the transition probabilities_____
   a) $\mathrm{P}\left(\omega_{\mathrm{j}}(\mathrm{t}+1)\middle|\omega_{\mathrm{i}}(\mathrm{t})\right) = \mathrm{b}_{\mathrm{ij}}$
   b) $\mathrm{P}\left(\omega_{\mathrm{j}}(\mathrm{t}+1)\middle|\omega_{\mathrm{i}}(\mathrm{t})\right) = \mathrm{b}_{\mathrm{jk}}$
   c) $\mathrm{P}\left(\omega_{\mathrm{j}}(\mathrm{t}+1)\middle|\omega_{\mathrm{i}}(\mathrm{t})\right) = \mathrm{a}_{\mathrm{ij}}$
   d) $\mathrm{P}\left(\mathrm{v}_{\mathrm{k}}(\mathrm{t})\middle|\omega_{\mathrm{j}}(\mathrm{t})\right) = \mathrm{b}_{\mathrm{jk}}$

14) Parzen-window classifier depends upon the choice of
   a) No. of sample points
   b) Window function
   c) Both a and b
   d) None of the above

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PATTEERN RECOGNITION (Elective – II)

Day & Date: Tuesday,26-11-2019 Max. Marks: 56
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 **12**

a) Suppose that the Random variables X & Y have the joint density function defined by $f(x,y) = c(2x+y) \quad 2 < x < 6 \ \& 0 < y < 5$
$= 0 \quad otherwise$
Find : 1) constant c, 2) $P(X > 3, Y > 2)$

b) Explain Maximum Likelihood Estimation. Note on the Gaussian Case where μ is unknown and covariance matrix (Σ) 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. **16**

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
$f(x,y) = c(x^2 + 2y), \quad x = 0,1,2, y = 1,2,3,4$
$= 0 \quad , \ otherwise$
Find :
1) the value of c 2) marginal probability functions of X & Y
3) 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. **12**

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. **16**

a) Explain fuzzy Optimization technique in recognition.

b) Write a note on Neural Networks.

c) Starting from fundamentals derive an expression for density estimation
$P_n(x) = \frac{K_n/n}{V_n}$

Seat No.	

Set **P**

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3. Each question carries one mark.
2) Assume suitable data if necessary.
3) 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 Marks: 14

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

1) 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) Indirect addressing
   c) Circular Mode d) Bit Reversed Addressing

2) The addressing mode that is convenient for FFT computation is _____.
   a) Indirect addressing b) Circular Mode
   c) Memory Mapped d) Bit Reversed 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

6) 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

8) The Memory mapped direct addressing mode is used to access data in page.
   a) 0 b) 1
   c) 511 d) 512

9) The register which holds the address of the current data memory page is _____.
   a) ARP b) DP
   c) ARB d) None

10) The size of the C6X CPU is _____.
   a) 16-bit b) 32-bit
   c) 40-bit d) 64-bit

11) The floating point devices in C6X processors are _____.
   a) C67X b) C62X
   c) C64X d) C64X & C62X

12) The C6X processor based on _____ architecture.
   a) Modified Harvard b) Advanced Harvard
   c) Veloci TI d) Davinci

13) _____ C54X assembler directive reserves and initializes n bits of memory and when a label is used with this directive, the label is assigned the address of the first word of the block reserved.
   a) .bes b) .space
   c) .word d) .data

14) The external SRAM capacity in C5402 kit is _____ words and requires _____ wait states.
   a) 64K,1 b) 64K,7
   c) 256K,1 d) 256K,7

Seat No.	

Set **P**

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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: **16**

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: **12**

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: **16**

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. **12**

a) Write the Program for convolutional codes using C54X program.
b) Explain Pipeline operation in C54X.
c) Draw & explain Architecture of Motorola DSP563XX.

SLR-FM-278

Seat No.	

Set Q

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3. Each question carries one mark.
2) Assume suitable data if necessary.
3) 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 Marks: 14

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

1) The Memory mapped direct addressing mode is used to access data in page.
   a) 0 b) 1
   c) 511 d) 512

2) The register which holds the address of the current data memory page is _____.
   a) ARP b) DP
   c) ARB d) None

3) The size of the C6X CPU is _____.
   a) 16-bit b) 32-bit
   c) 40-bit d) 64-bit

4) The floating point devices in C6X processors are _____.
   a) C67X b) C62X
   c) C64X d) C64X & C62X

5) The C6X processor based on _____ architecture.
   a) Modified Harvard b) Advanced Harvard
   c) Veloci TI d) Davinci

6) _____ C54X assembler directive reserves and initializes n bits of memory and when a label is used with this directive, the label is assigned the address of the first word of the block reserved.
   a) .bes b) .space
   c) .word d) .data

7) The external SRAM capacity in C5402 kit is _____ words and requires _____ wait states.
   a) 64K,1 b) 64K,7
   c) 256K,1 d) 256K,7

8) 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) Indirect addressing
   c) Circular Mode d) Bit Reversed Addressing

9) The addressing mode that is convenient for FFT computation is _____.
   a) Indirect addressing b) Circular Mode
   c) Memory Mapped d) Bit Reversed Addressing

10) 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

11) 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
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12) VLIW architecture differs from conventional P-DSP in which of the following aspects _____.
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   c) Using Pipelining
   d) A single word fetched from memory has a number of instructions

13) 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

14) 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

Seat No.	

Set **Q**

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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: **16**

a) Explain in detail signals and coefficients in DSP Systems.
b) Draw and explain briefly VLIW architecture.
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e) Explain in detail D/A conversion errors in DSP Systems.

Q.3 Attempt any two: **12**

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: **16**

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.
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d) Compare the feature of TMS320C6X and DSP563XX Processor.
e) Describe briefly Interrupts of TMS320C54XX Processor.

Q.5 Attempt any two. **12**

a) Write the Program for convolutional codes using C54X program.
b) Explain Pipeline operation in C54X.
c) Draw & explain Architecture of Motorola DSP563XX.

Seat No.	

Set **R**

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3. Each question carries one mark.
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3) 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 Marks: 14

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

1) VLIW architecture differs from conventional P-DSP in which of the following aspects _____.
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Seat No.	

Set | **R**

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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: **16**

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: **12**

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: **16**

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. **12**

a) Write the Program for convolutional codes using C54X program.
b) Explain Pipeline operation in C54X.
c) Draw & explain Architecture of Motorola DSP563XX.

SLR-FM-278

Seat No.	

Set S

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book Page No.3. Each question carries one mark.
2) Assume suitable data if necessary.
3) 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 Marks: 14

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

10) The size of the C6X CPU is _____.
a) 16-bit b) 32-bit
c) 40-bit d) 64-bit

2) The floating point devices in C6X processors are _____.
a) C67X b) C62X
c) C64X d) C64X & C62X

3) The C6X processor based on _____ architecture.
a) Modified Harvard b) Advanced Harvard
c) Veloci TI d) Davinci

4) _____ C54X assembler directive reserves and initializes n bits of memory and when a label is used with this directive, the label is assigned the address of the first word of the block reserved.
a) .bes b) .space
c) .word d) .data

5) The external SRAM capacity in C5402 kit is _____ words and requires _____ wait states.
a) 64K,1 b) 64K,7
c) 256K,1 d) 256K,7

6) 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) Indirect addressing
c) Circular Mode d) Bit Reversed Addressing

7) The addressing mode that is convenient for FFT computation is _____.
a) Indirect addressing b) Circular Mode
c) Memory Mapped d) Bit Reversed Addressing

8) 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

9) 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

10) 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

11) 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

12) 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

13) The Memory mapped direct addressing mode is used to access data in page.
   a) 0 b) 1
   c) 511 d) 512

14) The register which holds the address of the current data memory page is _____.
   a) ARP b) DP
   c) ARB d) None

SLR-FM-278

Seat No.	

Set S

B.E. (Part -II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DSP PROCESSORS & APPLICATION

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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: **16**

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: **12**

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: **16**

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. **12**

a) Write the Program for convolutional codes using C54X program.
b) Explain Pipeline operation in C54X.
c) Draw & explain Architecture of Motorola DSP563XX.

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) 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

2) As per IoT architectural view suggested by CISCO level-3 deals with, _____.
   a) Data abstraction b) Data accumulation
   c) Edge computing d) Connectivity

3) 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

4) 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

5) Which of these can be considered as the sensory organs for IoT?
   a) Buildings b) Transportation
   c) Banks d) Sensors

6) The address space in ARM is _____.
   a) 2^24 b) 2^64
   c) 2^16 d) 2^32

7) A programmable timer device used to ensure that processor is running is ____.
   a) Real Time Clock b) Phase Lock Loop
   c) Watchdog Timer d) Simulation Time Clock

8) LPC1768's maximum operating frequency is _____.
   a) 100MHz b) 110MHz
   c) 12MHz d) 60MHz

9) 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

10) MQTT is designed for _____.
   a) Remote connections
   b) Limited bandwidth
   c) Small-code footprint
   d) All of these

11) Which layer is CoAP?
   a) Control layer
   b) Transport layer
   c) Service layer
   d) Application layer

12) Wifi enabled device can be _____.
   a) PC
   b) Game Console
   c) Mobile phone
   d) All of the above

13) CoAP is a specialized _____ protocol.
   a) Web Transfer
   b) Power
   c) Application
   d) Resource

14) What is A2DP?
   a) Bluetooth profile for streaming audio
   b) Bluetooth profile for security
   c) Bluetooth profile for streaming video
   d) None of These

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) LPC1768's maximum operating frequency is _____.
   a) 100MHz b) 110MHz
   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 _____.
   a) Remote connections b) Limited bandwidth
   c) Small-code footprint d) All of these

4) Which layer is CoAP?
   a) Control layer b) Transport layer
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5) Wifi enabled device can be _____.
   a) PC b) Game Console
   c) Mobile phone d) All of the above

6) CoAP is a specialized _____ protocol.
   a) Web Transfer b) Power
   c) Application d) Resource

7) What is A2DP?
   a) Bluetooth profile for streaming audio
   b) Bluetooth profile for security
   c) Bluetooth profile for streaming video
   d) None of These

8) 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

9) As per IoT architectural view suggested by CISCO level-3 deals with, _____.
   a) Data abstraction b) Data accumulation
   c) Edge computing d) Connectivity

10) 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

11) 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

12) Which of these can be considered as the sensory organs for IoT?
   a) Buildings b) Transportation
   c) Banks d) Sensors

13) The address space in ARM is _____.
   a) 2^24 b) 2^64
   c) 2^16 d) 2^32

14) A programmable timer device used to ensure that processor is running is ____.
   a) Real Time Clock b) Phase Lock Loop
   c) Watchdog Timer d) Simulation Time Clock

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

a) List the components available in Intel based intelligent gateway for a smart home.
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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. **12**

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. **16**

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. **12**

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

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) Which of these can be considered as the sensory organs for IoT?
   a) Buildings b) Transportation
   c) Banks d) Sensors

2) The address space in ARM is _____.
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   b) MQTT is a client-server protocol
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9) CoAP is a specialized _____ protocol.
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SLR-FM-279

Seat No.	

Set R

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

a) List the components available in Intel based intelligent gateway for a smart home.
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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. **16**

a) List down principal components and topologies in a Zigbee network.
b) Discuss with neat diagram the IEEE 802.11 protocol stack.
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d) Discuss what is meant by RESTful protocol with an example.
e) What is MQTT protocol? List down the requirements provided by MQTT protocol.

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b) With neat diagram illustrate the differences in management of cloud models.
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2) RFID Interrogators
3) RFID Controllers
4) RFID frequency bands

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
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

1) MQTT is designed for _____.
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   c) Small-code footprint d) All of these

2) Which layer is CoAP?
   a) Control layer b) Transport layer
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   c) MQTT is a lightweight messaging protocol
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SLR-FM-279

Seat No.	

Set S

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INTERNET OF THINGS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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. **16**

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. **12**

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

Seat No.	

Set **P**

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) The complete solution of $(D^4 + 6D^2 + 9)y = 0$ is _____.
   a) $y = (c_1 + c_2x)e^x + (c_3 + c_4x)e^{-x}$
   b) $y = (c_1 + c_2)e^x + (c_3 + c_4x)e^{-x}$
   c) $y = (c_1 + c_2x)\cos\sqrt{3}x + (c_3 + c_4x)\sin\sqrt{3}x$
   d) $y = (c_1 + c_2x)\cos 3x + (c_3 + c_4x)\sin 3x$

3) The solution of $px + qy = z$ is _____.
   a) $\phi(x+y, y+z) = 0$ b) $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$
   c) $\phi\left(\frac{x^2}{y}, \frac{y^2}{z}\right) = 0$ d) $\phi(xy, yz) = 0$

4) The value of the integral $\int_0^\infty e^{-3t}\sin t dt$ is_____.
   a) 5 b) $\frac{1}{5}$
   c) 10 d) $\frac{1}{10}$

5) The Laplace transform of $(\sin t + \cos t)^2$ is _____.
   a) $\frac{1}{s} - \frac{2}{s^2+4}$ b) $\frac{1}{s} + \frac{2}{s^2+4}$
   c) $\frac{1}{s} - \frac{2}{s^2-4}$ d) $\frac{1}{s} + \frac{2}{s^2-4}$

6) $\frac{1}{(s+3)^2}$ is the Laplace transform of _____.
   a) $t\,e^{-3t}$ b) t^2e^{-3t}
   c) e^{-3t} d) $t\,e^{3t}$

7) $L^{-1}\left\{\frac{1}{s^2-6s+25}\right\} =$ _____.
   a) $\frac{e^{-3t}}{4}\sin 4t$ b) $\frac{e^{-3t}\cos 4t}{4}$
   c) $e^{-3t}\sin 4t$ d) $\frac{e^{3t}\sin 4t}{4}$

8) The directional derivative of $\phi = xy + yz + zx$ at (1,1,1) is maximum in the direction of _____.

a) $i + j + k$ b) $i - j + k$

c) $2i + 2j + 2k$ d) $2i - 2j + 2k$

9) 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

10) 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) $\frac{-1}{(z-a)^2}$

11) The inverse z-transform of $\frac{z}{z-1}, |z| > 1$ is _____.

a) -1 b) 1

c) 0 d) K

12) If $f(x) = x$ is represented by Fourier series in $(-\pi, \pi)$ then _____ is the constant term.

a) $\frac{\pi}{2}$ b) π

c) 0 d) 2π

13) For Fourier series expansion, function must be _____.

a) Harmonic b) Reimann

c) Cauchy d) Periodic

14) 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) $\sqrt{\frac{2}{\pi}}\left(\frac{1-\sin s}{s}\right)$ d) $\sqrt{\frac{2}{\pi}}\left(\frac{1-\cos s}{s}\right)$

Seat No.		Set	P

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 5 & Q. 6 are compulsory.
2) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.

Section – I

Q.2 Solve any three of the following questions. **09**

a) Solve $(D^2+4)y = \sin^2 x$

b) Solve $(D^2+3D+2)y = x^2+3x+1$

c) Solve $(D^2+2D+5)y = e^{-x}\sin 2x$

OR

Solve $(D^3+1)y = 65\cos(2x+1)$

Q.3 Solve the following questions. **09**

a) $z(p^2-q^2) = x-y$

b) $p^3+q^3 = 27z$

c) $px^2+qy^2 = (x+y)z$

Q.4 Solve 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

$$f(t) = \frac{kt}{T}, 0 < t < T$$

where $f(t+T) = f(t)$

Q.5 Solve the following questions.

a) Find $L^{-1}\left\{\frac{2s^2+5s-4}{s^3+s^2-2s}\right\}$ **03**

b) Using the convolution theorem, find the inverse Laplace transform of **03**

$$\frac{1}{(s-1)(s^2+1)}$$

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 determine unit tangent vector at $t = 2$. **04**

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**

Q.7 **a)** Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) **05**

OR

Find the Fourier series of $f(x) = x^2 - 2,\ -2 \le x \le 2$ **05**

b) Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ **04**

Q.8 **a)** Express $f(x) = \begin{cases} \sin x\,, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$ **03**

as a Fourier integral and show that

$$\int_0^\infty \frac{\sin wx . \sin \pi w}{1 - w^2}\, dw = \begin{cases} \frac{\pi}{2} . \sin x\,, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$$

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 **Solve any three of the following questions.** **09**

a) Find the inverse z-transform of $\frac{1}{z^2 - 3z + 2}, |z| > 2$

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 $z\left\{4^k + \frac{1}{4^k}\right\}, k \ge 0$

Seat No.	

Set **Q**

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
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 Marks: 14

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

1) The directional derivative of $\phi = xy + yz + zx$ at (1,1,1) is maximum in the direction of _____.
   a) $i + j + k$ b) $i - j + k$
   c) $2i + 2j + 2k$ d) $2i - 2j + 2k$

2) 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

3) 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) $\frac{-1}{(z-a)^2}$

4) The inverse z-transform of $\frac{z}{z-1}, |z| > 1$ is _____.
   a) -1 b) 1
   c) 0 d) K

5) If $f(x) = x$ is represented by Fourier series in $(-\pi, \pi)$ then _____ is the constant term.
   a) $\frac{\pi}{2}$ b) π
   c) 0 d) 2π

6) For Fourier series expansion, function must be _____.
   a) Harmonic b) Reimann
   c) Cauchy d) Periodic

7) 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) $\sqrt{\frac{2}{\pi}}\left(\frac{1-\sin s}{s}\right)$ d) $\sqrt{\frac{2}{\pi}}\left(\frac{1-\cos s}{s}\right)$

8) 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

9) 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) $y = (c_1 + c_2)e^x + (c_3 + c_4 x)e^{-x}$

c) $y = (c_1 + c_2 x)\cos\sqrt{3}x + (c_3 + c_4 x)\sin\sqrt{3}x$

d) $y = (c_1 + c_2 x)\cos 3x + (c_3 + c_4 x)\sin 3x$

10) The solution of $px + qy = z$ is _____.

a) $\phi(x+y, y+z) = 0$ b) $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

c) $\phi\left(\frac{x^2}{y}, \frac{y^2}{z}\right) = 0$ d) $\phi(xy, yz) = 0$

11) The value of the integral $\int_0^\infty e^{-3t}\sin t dt$ is_____.

a) 5 b) $\frac{1}{5}$

c) 10 d) $\frac{1}{10}$

12) The Laplace transform of $(\sin t + \cos t)^2$ is _____.

a) $\frac{1}{s} - \frac{2}{s^2+4}$ b) $\frac{1}{s} + \frac{2}{s^2+4}$

c) $\frac{1}{s} - \frac{2}{s^2-4}$ d) $\frac{1}{s} + \frac{2}{s^2-4}$

13) $\frac{1}{(s+3)^2}$ is the Laplace transform of _____.

a) $t\,e^{-3t}$ b) $t^2 e^{-3t}$

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) $\frac{e^{-3t}\cos 4t}{4}$

c) $e^{-3t}\sin 4t$ d) $\frac{e^{3t}\sin 4t}{4}$

Seat No.		Set	Q

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 5 & Q. 6 are compulsory.
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Section – I

Q.2 Solve any three of the following questions. **09**

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c) Solve $(D^2+2D+5)y = e^{-x}\sin 2x$

OR

Solve $(D^3+1)y = 65\cos(2x+1)$

Q.3 Solve the following questions. **09**

a) $z(p^2-q^2) = x-y$

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Q.4 Solve 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

$$f(t) = \frac{kt}{T}, 0 < t < T$$

where $f(t+T) = f(t)$

Q.5 Solve the following questions.

a) Find $L^{-1}\left\{\frac{2s^2+5s-4}{s^3+s^2-2s}\right\}$ **03**

b) Using the convolution theorem, find the inverse Laplace transform of **03**

$$\frac{1}{(s-1)(s^2+1)}$$

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 determine unit tangent vector at $t = 2$. **04**

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**

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Q.7 **a)** Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) **05**

OR

Find the Fourier series of $f(x) = x^2 - 2,\ -2 \le x \le 2$ **05**

b) Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ **04**

Q.8 **a)** Express $f(x) = \begin{cases} \sin x\,, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$ **03**

as a Fourier integral and show that

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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 **Solve any three of the following questions.** **09**

a) Find the inverse z-transform of $\frac{1}{z^2 - 3z + 2}, |z| > 2$

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 $z\left\{3^k \sin\left(\frac{k\pi}{2}\right)\right\}, k \ge 0$

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Seat No.	

Set **R**

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
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.
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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) The Laplace transform of $(\sin t + \cos t)^2$ is _____.
   a) $\frac{1}{s} - \frac{2}{s^2+4}$ b) $\frac{1}{s} + \frac{2}{s^2+4}$
   c) $\frac{1}{s} - \frac{2}{s^2-4}$ d) $\frac{1}{s} + \frac{2}{s^2-4}$

2) $\frac{1}{(s+3)^2}$ is the Laplace transform of _____.
   a) $t\,e^{-3t}$ b) $t^2 e^{-3t}$
   c) e^{-3t} d) $t\,e^{3t}$

3) $L^{-1}\left\{\frac{1}{s^2-6s+25}\right\} =$ _____.
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   c) $e^{-3t}\sin 4t$ d) $\frac{e^{3t}\sin 4t}{4}$

4) The directional derivative of $\phi = xy + yz + zx$ at (1,1,1) is maximum in the direction of _____.
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9) For Fourier series expansion, function must be _____.

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11) The particular Integral of $(D+1)^3 y = e^{-x}$ is _____.

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d) $y = (c_1 + c_2 x)\cos 3x + (c_3 + c_4 x)\sin 3x$

13) The solution of $px + qy = z$ is _____.

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14) The value of the integral $\int_0^\infty e^{-3t}\sin t dt$ is_____.

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Seat No.		Set	R

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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Section – I

Q.2 Solve any three of the following questions. **09**

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a) Find $L\{e^{-t}\cos^2 3t\}$

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where $f(t+T) = f(t)$

Q.5 Solve the following questions.

a) Find $L^{-1}\left\{\frac{2s^2+5s-4}{s^3+s^2-2s}\right\}$ **03**

b) Using the convolution theorem, find the inverse Laplace transform of **03**

$$\frac{1}{(s-1)(s^2+1)}$$

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 determine unit tangent vector at $t = 2$. **04**

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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**

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b) Find Fourier sine transform of $f(x) = \begin{cases} \sin x\,, & 0 < x < 1 \\ 0, & x > 1 \end{cases}$ **03**

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Q.9 **Solve any three of the following questions.** **09**

a) Find the inverse z-transform of $\frac{1}{z^2 - 3z + 2}, |z| > 2$

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c) Find $z\left\{3^k \sin\left(\frac{k\pi}{2}\right)\right\}, k \ge 0$

d) Find $z\left\{4^k + \frac{1}{4^k}\right\}, k \ge 0$

Seat No.	

Set **S**

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

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
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.
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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) 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
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3) If $f(x) = x$ is represented by Fourier series in $(-\pi, \pi)$ then _____ is the constant term.

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b) $y = (c_1 + c_2)e^x + (c_3 + c_4 x)e^{-x}$
c) $y = (c_1 + c_2 x)\cos\sqrt{3}x + (c_3 + c_4 x)\sin\sqrt{3}x$
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8) The solution of $px + qy = z$ is _____.

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Seat No.		Set	S

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Section – I

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a) Solve $(D^2+4)y = \sin^2 x$

b) Solve $(D^2+3D+2)y = x^2+3x+1$

c) Solve $(D^2+2D+5)y = e^{-x}\sin 2x$

OR

Solve $(D^3+1)y = 65\cos(2x+1)$

Q.3 Solve the following questions. **09**

a) $z(p^2-q^2) = x-y$

b) $p^3+q^3 = 27z$

c) $px^2+qy^2 = (x+y)z$

Q.4 Solve 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

$$f(t) = \frac{kt}{T}, 0 < t < T$$

where $f(t+T) = f(t)$

Q.5 Solve the following questions.

a) Find $L^{-1}\left\{\frac{2s^2+5s-4}{s^3+s^2-2s}\right\}$ **03**

b) Using the convolution theorem, find the inverse Laplace transform of **03**

$$\frac{1}{(s-1)(s^2+1)}$$

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 determine unit tangent vector at $t = 2$. **04**

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**

Q.7 **a)** Find the Fourier expansion of $f(x) = 2x - x^2$ in (0,3) **05**

OR

Find the Fourier series of $f(x) = x^2 - 2,\ -2 \le x \le 2$ **05**

b) Find the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ **04**

Q.8 **a)** Express $f(x) = \begin{cases} \sin x\,, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$ **03**

as a Fourier integral and show that

$$\int_0^\infty \frac{\sin wx . \sin \pi w}{1 - w^2}\, dw = \begin{cases} \frac{\pi}{2} . \sin x\,, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$$

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 **Solve any three of the following questions.** **09**

a) Find the inverse z-transform of $\frac{1}{z^2 - 3z + 2}, |z| > 2$

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 $z\left\{4^k + \frac{1}{4^k}\right\}, k \ge 0$

Seat No.	

Set **P**

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 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 necessary.
3) 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) An input voltage of 20Vrms is given to voltage doubler circuit. What is the output voltage?
   a) 56.56V b) 40V
   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) $2\mathrm{Vm}$ b) $\mathrm{Vm}/2$
   c) Vm d) $2\mathrm{Vm}/\pi$

4) Back emf in LC filter can be avoided by using _____.
   a) Inductor filter b) Using capacitor filter
   c) Using bleeder resistor d) Using bleeder capacitor

5) If one of the diode in center tapped full wave rectifier circuit get damaged it act like _____.
   a) Clipper circuit b) Half wave rectifier
   c) Both a & b d) Cant say

6) Reverse saturation current gets _____ for every _____ rise in temperature.
   a) Half, $10℃$ b) Triple, $30℃$
   c) Double, $10℃$ d) Constant, $20℃$

7) The critical value of inductance in choke input filter is _____.
   a) $3\omega/\mathrm{R_L}$ b) $\mathrm{R_L}/3\omega$
   c) $3\omega\mathrm{R_L}$ d) $\mathrm{R_L}$

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

9) Which region is lightly doped with an impurity by forming PN junctions in JFET?
   a) Source b) Drain
   c) Gate d) Channel

10) Icbo in transistor can be reduced by reducing _____.
   a) I_B b) I_E
   c) Vcc d) Temperature

11) In a tansistor, $I_c = 100$ mA and $I_E = 100.2$ mA. The value of β is _____.
   a) 100 b) 200
   c) about 1 d) 50

12) The voltage gain of a transistor connected in common collector arrangement are _____.
   a) equal to 1 b) more than 10
   c) less than 1 d) more than 100

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) BC 147 transistor indicates that it is made of _____.
   a) germanium b) silicon
   c) carbon d) none of the above

Seat No.	

Set **P**

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 Max. Marks: 56
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.

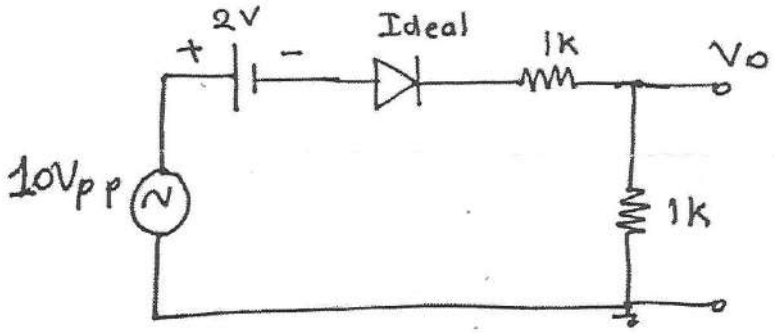
Section – I

Q.2 Solve any Four. **16**

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.



fig·1

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. **12**

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. **16**

a) Calculate Q point coordinates for collector to base biasing circuit for Si transistor with

$$R_C = 1\ K\Omega, R_B = 100\ K\Omega\ Vcc = 12V, \beta dc = 100.$$

b) Justify output voltage signal is 180^o 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.

Q.5 Attempt any Two. **12**

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 = 1.4KΩ.

b) Consider transistor CE amplifier with R_L = 2.7KΩ, hie=4.5KΩ, hre=2 X 10^{-4}, hfe=-330, hoe=30μʊ. Calculate Ai, Av, Ri, Ro.

c) Explain Common Source JFET amplifier with its basic parameters.

Seat No.	

Set **Q**

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 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 necessary.
3) 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) 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

2) Which region is lightly doped with an impurity by forming PN junctions in JFET?
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3) Icbo in transistor can be reduced by reducing _____.
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   c) carbon d) none of the above

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9) 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

10) PIV of diode used in voltage multiplier circuit is _____.
   a) $2Vm$ b) $Vm/2$
   c) Vm d) $2Vm/\pi$

11) Back emf in LC filter can be avoided by using _____.
   a) Inductor filter b) Using capacitor filter
   c) Using bleeder resistor d) Using bleeder capacitor

12) If one of the diode in center tapped full wave rectifier circuit get damaged it act like _____.
   a) Clipper circuit b) Half wave rectifier
   c) Both a & b d) Cant say

13) Reverse saturation current gets _____ for every _____ rise in temperature.
   a) Half, $10℃$ b) Triple, $30℃$
   c) Double, $10℃$ d) Constant, $20℃$

14) 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_L

Seat No.	

Set **Q**

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 Max. Marks: 56
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.

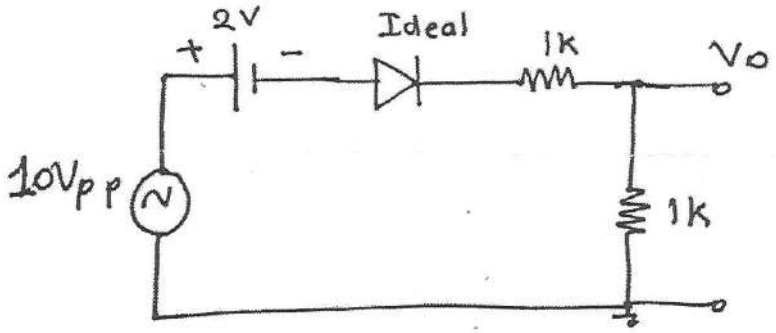
Section – I

Q.2 Solve any Four. **16**

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.



fig·1

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. **12**

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. **16**

a) Calculate Q point coordinates for collector to base biasing circuit for Si transistor with

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b) Justify output voltage signal is 180^o out of phase with input signal with suitable diagram for transistor Common Emitter amplifier.

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e) Explain high frequency response of BJT amplifier.

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b) Consider transistor CE amplifier with R_L = 2.7KΩ, hie=4.5KΩ, hre=2 X 10^{-4}, hfe=-330, hoe=30μʊ. Calculate Ai, Av, Ri, Ro.

c) Explain Common Source JFET amplifier with its basic parameters.

Seat No.	

Set R

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 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 necessary.
3) 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) If one of the diode in center tapped full wave rectifier circuit get damaged it act like _____.
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   a) Half, $10℃$ b) Triple, $30℃$
   c) Double, $10℃$ d) Constant, $20℃$

3) The critical value of inductance in choke input filter is _____.
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   c) $3\omega R_L$ d) R_L

4) Which are the majority charge carriers in N-channel JFET by enhancing the flow of current between two P-regions or gates?
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11) An input voltage of 20Vrms is given to voltage doubler circuit. What is the output voltage?
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   a) $2\mathrm{Vm}$
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Seat No.	

Set **R**

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 Max. Marks: 56
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.

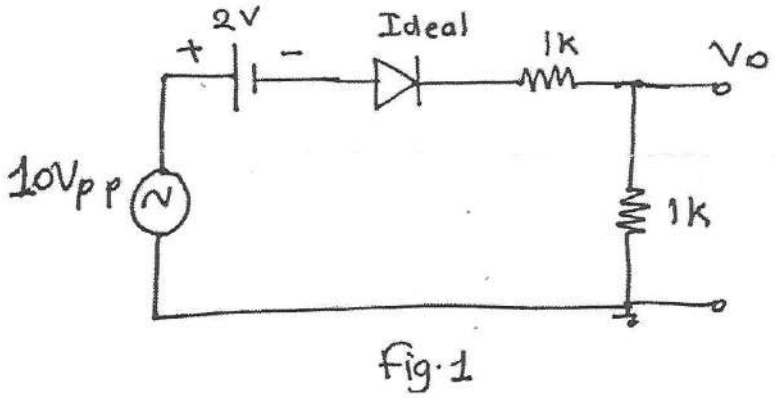
Section – I

Q.2 Solve any Four. **16**

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.



fig·1

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. **12**

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%.

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c) Explain junction capacitances of diode and derive expression for diffusion capacitance.

Section – II

Q.4 Attempt any Four. **16**

a) Calculate Q point coordinates for collector to base biasing circuit for Si transistor with

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e) Explain high frequency response of BJT amplifier.

Q.5 Attempt any Two. **12**

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b) Consider transistor CE amplifier with R_L = 2.7KΩ, hie=4.5KΩ, hre=2 X 10^{-4}, hfe=-330, hoe=30μʊ. Calculate Ai, Av, Ri, Ro.

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Seat No.	

Set **S**

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 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 necessary.
3) 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) Icbo in transistor can be reduced by reducing _____.
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   a) Source
   b) Drain
   c) Gate
   d) Channel

Seat No.	

Set **S**

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 Max. Marks: 56
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. **16**

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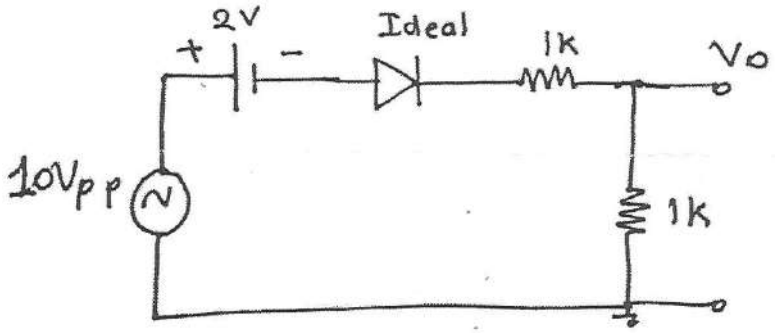

fig·1

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.

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SLR-FM-677

Seat No.	

Set P

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

Day & Date: Thursday, 12-12-2019 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) 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 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 _____.
   a) Equal to load resistance b) less than load resistance
   c) Greater than load resistance d) None of the above

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 b) 50
   c) 100 d) 500

4) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?
   a) Resistive & maximum b) Resistive & minimum
   c) Reactive & maximum d) Reactive & minimum

5) How is the short circuit reverse transfer admittance (Y_{12}) calculated?
   a) V2/11 (keeping 12 =0) b) 12/V1 (keeping V2=0)
   c) 11/ V2 (keeping V1 = 0) d) V1/12 (keeping 11 =0)

6) In a certain series resonant circuit, V_c = 125V. V_L = 125V, and V_R= 40V. The value of the source voltage is _____.
   a) 50V b) 125V
   c) 40V d) 250V

7) Which elements act as independent variables in Z-parameters?
   a) Current b) Voltage
   c) Both a and b d) None of the above

8) In RC series circuit R = 2Ω, C = 2μF and 10V dc is applied. Then what is the value of current at steady state?
   a) 0A b) 5 A
   c) 20A d) 10A

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 _____.
   a) R
   b) L
   c) C
   d) Either L or C

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.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

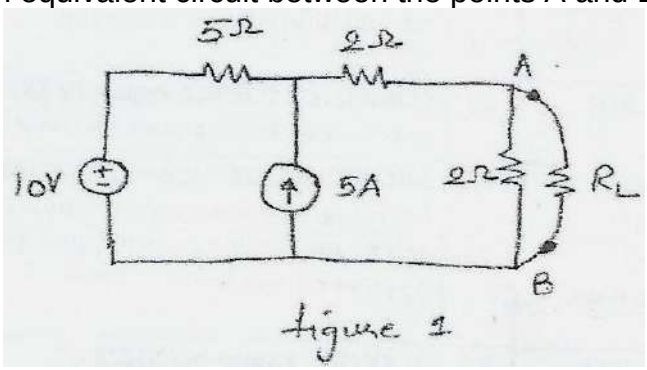
Day & Date: Thursday, 12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

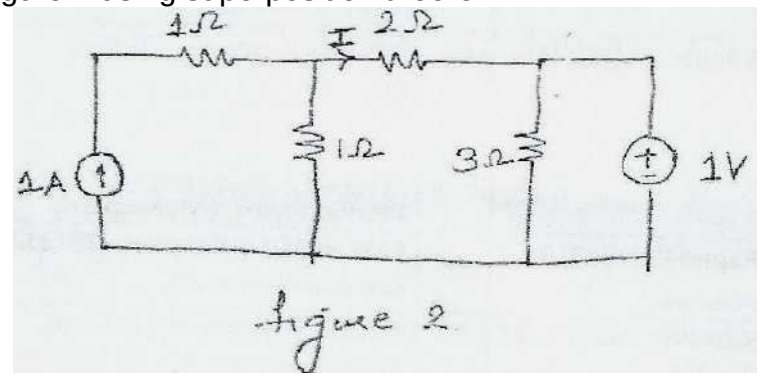
Section – I

Q.2 Answer any four from the following questions. **16**

a) Find the Norton equivalent circuit between the points A and B in figure 1?

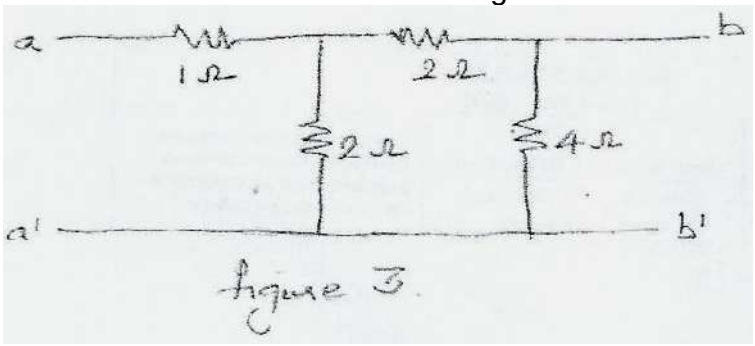


b) Find in 1 figure 2 using superposition theorem?



c) A 50μF, when connected in series with a coil having 40Ω resistance, resonates al 1000Hz. Find the inductance of the coil. Also obtain the maximum current if the applied voltage is 100V.

d) Find Y-parameters for the network shown in figure 3.



e) Derive h-parameters for two port network in terms of voltage. Current and draw h-parameter equivalent circuit.

Q.3 Answer any two from the following questions **12**

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?

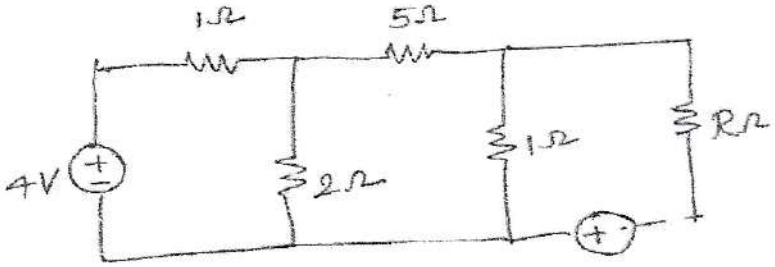


figure 4

b) Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.

c) Determine Z parameters for π type network shown in figure 5.

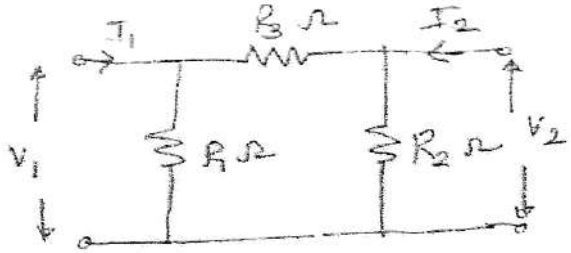


figure 5.

Section – II

Q.4 Answer any four from the following questions **16**

a) Determine the current i(t) for $t \geq 0$ if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.

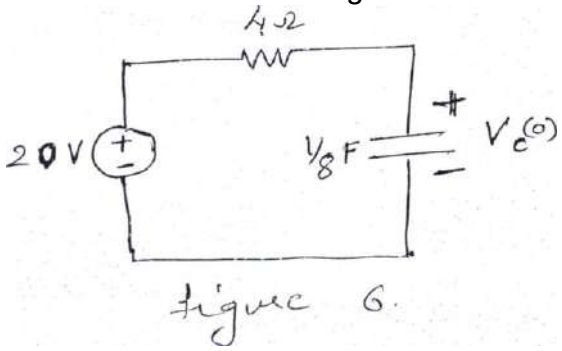


figure 6.

Initial voltage c
V_c (o)=4V

b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of 500Ω impedance.

c) Plot the pole zero diagram for H(s) = 2s /[(s+2)(s2+2s+2)]

d) Design a k-type high-pass filter (T and π) with, a cut-off frequency of 1kHz with a terminated design impedance of 800 Ω

e) 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

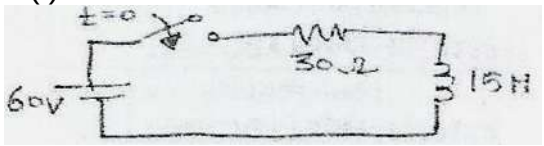


figure 7

Q.5 Answer any two from the following questions **12**

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 π type filter having a design impedance of 500Ω and cut-off frequencies 1kHz and 10kHz.

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

Day & Date: Thursday, 12-12-2019 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) 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) In RC series circuit R = 2Ω, C = 2μF and 10V dc is applied. Then what is 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 d) Either L or 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
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5) A band elimination filter is one which _____.
   a) Attenuates ail frequencies less than lower cut off frequency
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6) Relation between neper and decibel is _____.
   a) N=log(attn in dB/20) b) N=log(20/ attn in dB)
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7) 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

8) 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

9) For maximum transfer of power the source resistance must be _____.
   a) Equal to load resistance b) less than load resistance
   c) Greater than load resistance d) None of the above

10) 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 b) 50
   c) 100 d) 500

11) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?
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12) How is the short circuit reverse transfer admittance (Y_{12}) calculated?
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   c) 11/ V2 (keeping V1 = 0) d) V1/12 (keeping 11 =0)

13) In a certain series resonant circuit, V_c = 125V. V_L = 125V, and V_R= 40V. The value of the source voltage is _____.
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   c) 40V d) 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

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

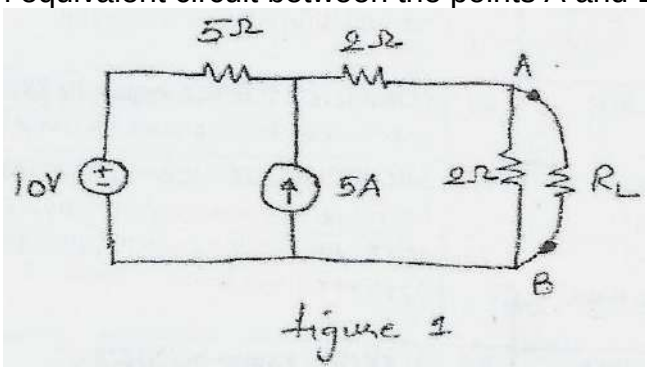
Day & Date: Thursday, 12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

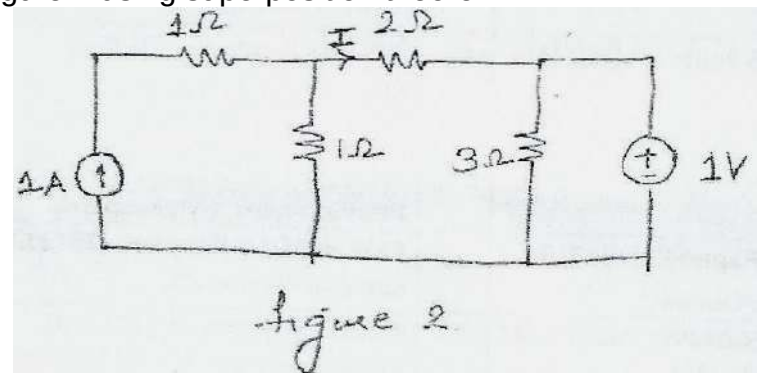
Section – I

Q.2 Answer any four from the following questions. **16**

a) Find the Norton equivalent circuit between the points A and B in figure 1?

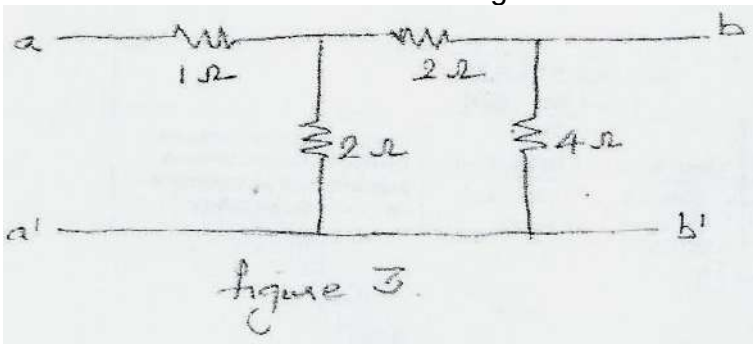


b) Find in 1 figure 2 using superposition theorem?



c) A 50μF, when connected in series with a coil having 40Ω resistance, resonates al 1000Hz. Find the inductance of the coil. Also obtain the maximum current if the applied voltage is 100V.

d) Find Y-parameters for the network shown in figure 3.



e) Derive h-parameters for two port network in terms of voltage. Current and draw h-parameter equivalent circuit.

Q.3 Answer any two from the following questions **12**

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?

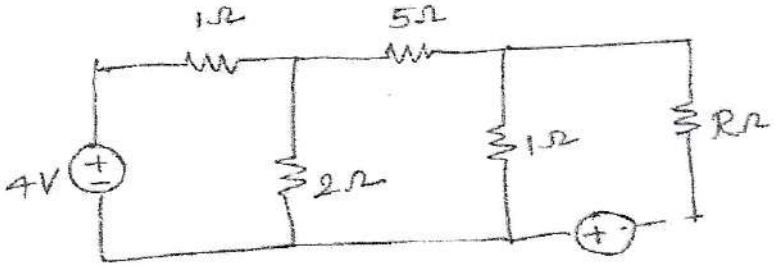


figure 4

b) Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.

c) Determine Z parameters for π type network shown in figure 5.

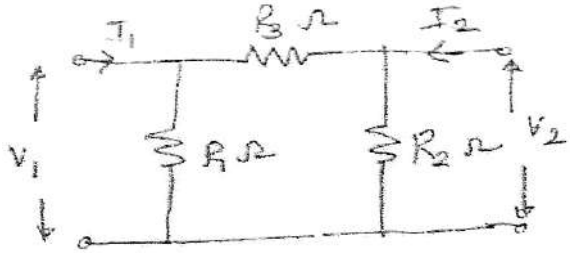


figure 5.

Section – II

Q.4 Answer any four from the following questions **16**

a) Determine the current i(t) for $t \geq 0$ if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.

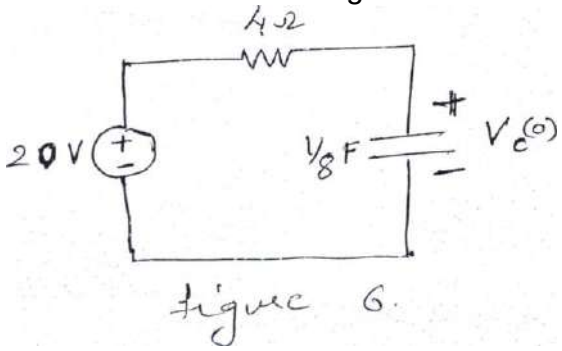


figure 6.

Initial voltage c
V_c (o)=4V

b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of 500Ω impedance.

c) Plot the pole zero diagram for H(s) = 2s /[(s+2)(s2+2s+2)]

d) Design a k-type high-pass filter (T and π) with, a cut-off frequency of 1kHz with a terminated design impedance of 800 Ω

e) 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

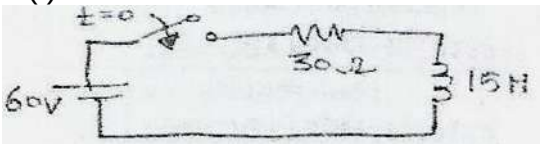


figure 7

Q.5 Answer any two from the following questions **12**

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 π type filter having a design impedance of 500Ω and cut-off frequencies 1kHz and 10kHz.

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

Day & Date: Thursday, 12-12-2019 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) 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) How is the short circuit reverse transfer admittance (Y_{12}) calculated?
   a) V2/11 (keeping 12 =0) b) 12/V1 (keeping V2=0)
   c) 11/ V2 (keeping V1 = 0) d) V1/12 (keeping 11 =0)

2) In a certain series resonant circuit, V_c = 125V. V_L = 125V, and V_R= 40V. The value of the source voltage is _____.
   a) 50V b) 125V
   c) 40V d) 250V

3) Which elements act as independent variables in Z-parameters?
   a) Current b) Voltage
   c) Both a and b d) None of the above

4) In RC series circuit R = 2Ω, C = 2μF and 10V dc is applied. Then what is the value of current at steady state?
   a) 0A b) 5 A
   c) 20A d) 10A

5) Time constant of RL series circuit is _____.
   a) 2L/R b) L/R
   c) RL d) R/L

6) Transients are presents in the circuit when the circuit is having _____.
   a) R b) L
   c) C d) Either L or C

7) An ideal filter is one which _____.
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11) The superposition theorem is applicable on _____.
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14) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?
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Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

Day & Date: Thursday, 12-12-2019 Max. Marks: 56
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 from the following questions. **16**

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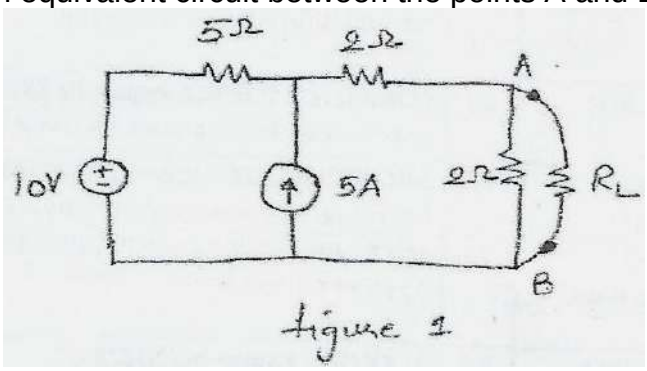

figure 1

b) Find in 1 figure 2 using superposition theorem?

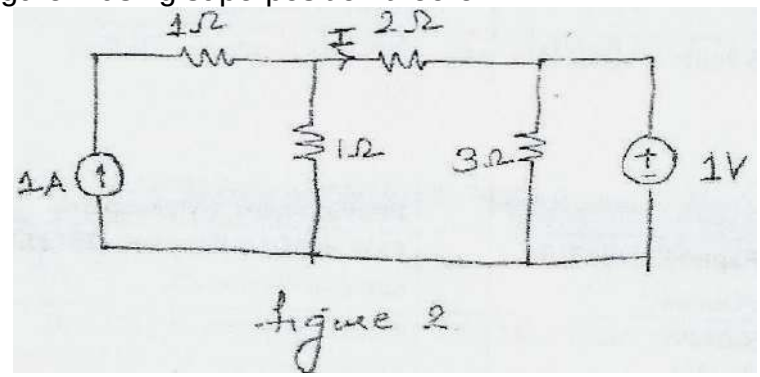

figure 2

c) A 50μF, when connected in series with a coil having 40Ω resistance, resonates al 1000Hz. Find the inductance of the coil. Also obtain the maximum current if the applied voltage is 100V.

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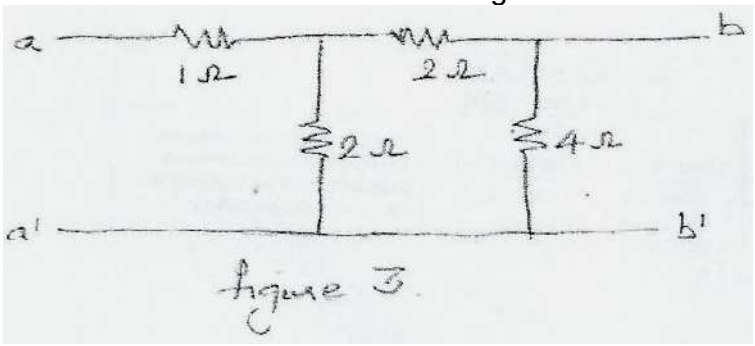

figure 3.

e) Derive h-parameters for two port network in terms of voltage. Current and draw h-parameter equivalent circuit.

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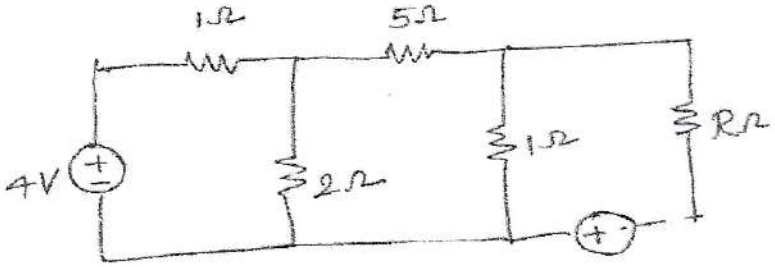

figure 4

b) Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.

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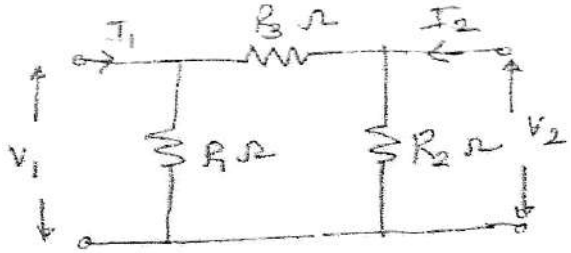
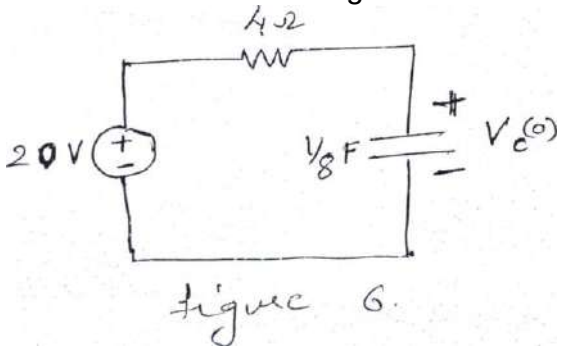


figure 5.

Section – II

Q.4 Answer any four from the following questions **16**

a) Determine the current i(t) for $t \geq 0$ if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.



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Initial voltage c
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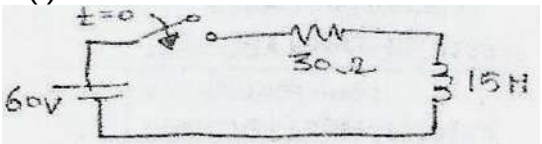

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c) Design a k-type band pass T and π type filter having a design impedance of 500Ω and cut-off frequencies 1kHz and 10kHz.

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

Day & Date: Thursday, 12-12-2019 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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1) Transients are presents in the circuit when the circuit is having _____.
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   a) Equal to load resistance b) less than load resistance
   c) Greater than load resistance d) None of the above

8) 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 b) 50
   c) 100 d) 500

9) What would be the value of impedance of a parallel resonant circuit at anti resonance condition?
   a) Resistive & maximum b) Resistive & minimum
   c) Reactive & maximum d) Reactive & minimum

10) How is the short circuit reverse transfer admittance (Y_{12}) calculated?
   a) V2/11 (keeping 12 =0) b) 12/V1 (keeping V2=0)
   c) 11/ V2 (keeping V1 = 0) d) V1/12 (keeping 11 =0)

11) In a certain series resonant circuit, V_c = 125V. V_L = 125V, and V_R= 40V. The value of the source voltage is _____.
   a) 50V b) 125V
   c) 40V d) 250V

12) Which elements act as independent variables in Z-parameters?
   a) Current b) Voltage
   c) Both a and b d) None of the above

13) In RC series circuit R = 2Ω, C = 2μF and 10V dc is applied. Then what is the value of current at steady state?
   a) 0A b) 5 A
   c) 20A d) 10A

14) Time constant of RL series circuit is _____.
   a) 2L/R b) L/R
   c) RL d) R/L

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
CIRCUITS & NETWORKS

Day & Date: Thursday, 12-12-2019 Max. Marks: 56
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 four from the following questions. **16**

a) Find the Norton equivalent circuit between the points A and B in figure 1?

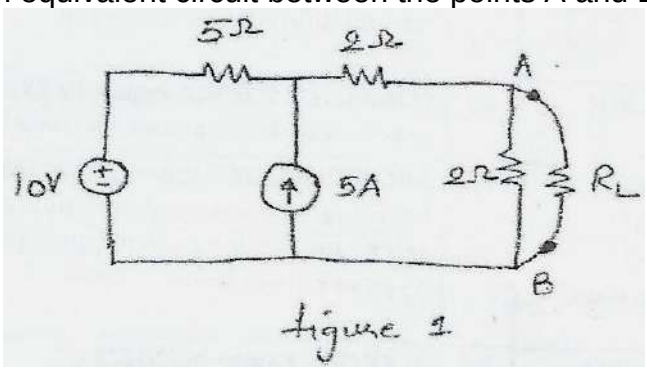

figure 1

b) Find in 1 figure 2 using superposition theorem?

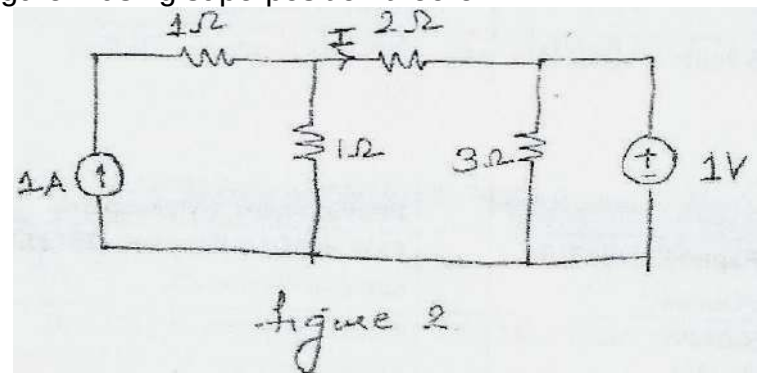

figure 2

c) A 50μF, when connected in series with a coil having 40Ω resistance, resonates al 1000Hz. Find the inductance of the coil. Also obtain the maximum current if the applied voltage is 100V.

d) Find Y-parameters for the network shown in figure 3.

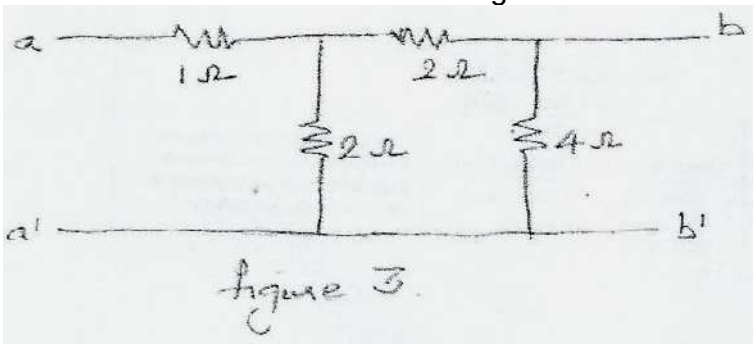

figure 3.

e) Derive h-parameters for two port network in terms of voltage. Current and draw h-parameter equivalent circuit.

Q.3 Answer any two from the following questions **12**

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?

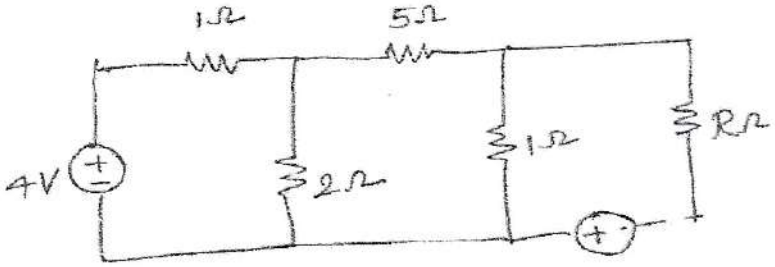

figure 4

b) Derive the expression for frequency at which the Voltage across inductor will be maximum in series resonance circuit.

c) Determine Z parameters for π type network shown in figure 5.

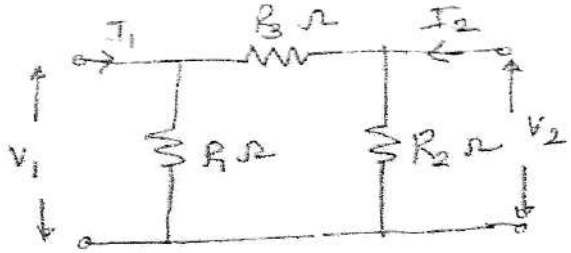

figure 5.

Section – II

Q.4 Answer any four from the following questions **16**

a) Determine the current i(t) for $t \geq 0$ if initial voltage on capacitor Vc(o) =4V for the circuit shown in figure 6.

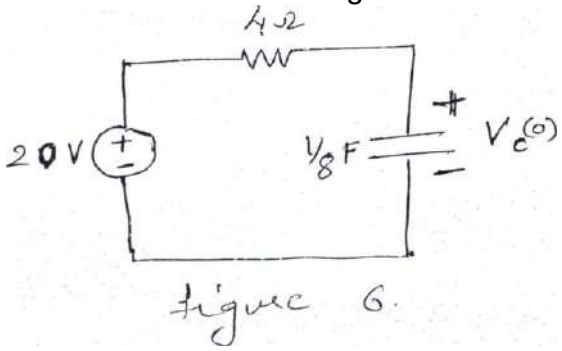

figure 6.

Initial voltage c
V_c (o)=4V

b) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of 500Ω impedance.

c) Plot the pole zero diagram for H(s) = 2s /[(s+2)(s2+2s+2)]

d) Design a k-type high-pass filter (T and π) with, a cut-off frequency of 1kHz with a terminated design impedance of 800 Ω

e) 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

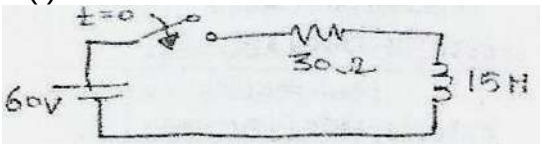

figure 7

Q.5 Answer any two from the following questions **12**

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 π type filter having a design impedance of 500Ω and cut-off frequencies 1kHz and 10kHz.

Seat No.	

Set **P**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) 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

2) 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

3) 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

4) 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

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

6) How many NAND gates are used to construct Active High S-R flip flop?
   a) 5 b) 3
   c) 4 d) 8

7) In comparison with Serial adder the Parallel adder _____.
   a) is slower
   b) has same speed
   c) is faster
   d) has delayed output

8) Maximum MOD number for a 2-bit binary counter is _____.
   a) 4
   b) 3
   c) 8
   d) 16

9) 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

10) 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

11) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
   a) 32
   b) 16
   c) 5
   d) 4

12) 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

13) 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

14) How many flip-flops are in the IC7495?
   a) 1
   b) 2
   c) 3
   d) 4

Seat No.	

Set **P**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) Maximum MOD number for a 2-bit binary counter is _____.
   a) 4 b) 3
   c) 8 d) 16

2) 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

3) 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

4) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
   a) 32 b) 16
   c) 5 d) 4

5) 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

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

7) How many flip-flops are in the IC7495?
   a) 1 b) 2
   c) 3 d) 4

8) 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

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

14) In comparison with Serial adder the Parallel adder _____.
   a) is slower b) has same speed
   c) is faster d) has delayed output

Seat No.	

Set **Q**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **R**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) 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 slower b) has same speed
   c) 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

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
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   a) i, ii, iii b) i, iii, iv
   c) i, ii, iv d) ii, iii, iv

14) Consider the following statements.
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   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

Seat No.	

Set **R**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **S**

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

Day & Date: Saturday, 14-12-2019 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) Figures to the right indicate full marks.
3) Draw neat diagrams.
4) 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

1) 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

2) How many minimum number of flip-flops are required to make a MOD-28 binary counter?
   a) 32 b) 16
   c) 5 d) 4

3) 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

4) 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

5) How many flip-flops are in the IC7495?
   a) 1 b) 2
   c) 3 d) 4

6) 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

7) 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

8) 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

9) 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

10) 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

11) How many NAND gates are used to construct Active High S-R flip flop?
   a) 5 b) 3
   c) 4 d) 8

12) In comparison with Serial adder the Parallel adder _____.
   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

14) 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

Seat No.	

Set **S**

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

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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. **16**

a) Implement the following Boolean function F, using NOR logic
$F(A, B, C, D) = \sum(0, 4, 8, 9, 10, 11, 12, 14)$

b) Explain and design a 2-bit magnitude comparator which should compare x & y and give output as x>y, x=y and x<y.

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **P**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 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 Page No.3
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. 14

1) 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

2) A sequence of data structures connected together through links are known to be _____.
   a) Connected list b) Linked list
   c) Traversed link d) Compound List

3) 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

4) 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

5) _____ level is where the model becomes compatible executable code.
   a) Abstract level b) Application level
   c) Implementation level d) AII of the above

6) Stack is also called as _____.
   a) Last in first out b) First in last out
   c) Last in last out d) First in first out

7) _____ is not the component of data structure.
   a) Operations b) Storage Structures
   c) Algorithms d) None of above

8) _____ is very useful in situation when data have to stored and then retrieved in reverse order.
   a) Stack b) Queue
   c) List d) Link list

9) Which data structure allows deleting data elements from and inserting at rear?
   a) Stacks b) Queues
   c) Dequeues d) 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
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.	

Set **P**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) Explain Quick sort with example.
b) Write a program for linear search & explain.
c) Explain DFS & BFS traverse with example.

Seat No.	

Set **Q**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 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 Page No.3
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. **14**

1) _____ is very useful in situation when data have to stored and then retrieved in reverse order.
   a) Stack b) Queue
   c) List d) Link list

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?
   a) Stacks b) List
   c) Strings d) Trees

4) Which of the following data structure is linear type?
   a) Graph b) Trees
   c) Binary tree d) Stack

5) 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
   c) Priority queues d) Stack

6) Which data structure is used in breadth first search of a graph to hold nodes?
   a) Stack b) Queue
   c) Tree d) Array

7) 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

8) 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

9) A sequence of data structures connected together through links are known to be _____.
   a) Connected list
   b) Linked list
   c) Traversed link
   d) 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
   b) Application level
   c) Implementation level
   d) AII of the above

13) Stack is also called as _____.
   a) Last in first out
   b) First in last out
   c) Last in last out
   d) First in first out

14) _____ is not the component of data structure.
   a) Operations
   b) Storage Structures
   c) Algorithms
   d) None of above

Seat No.	

Set **Q**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) Explain Quick sort with example.
b) Write a program for linear search & explain.
c) Explain DFS & BFS traverse with example.

Seat No.	

Set **R**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 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 Page No.3
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. 14

1) _____ level is where the model becomes compatible executable code.
   a) Abstract level b) Application level
   c) Implementation level d) AII of the above

2) Stack is also called as _____.
   a) Last in first out b) First in last out
   c) Last in last out d) First in first out

3) _____ is not the component of data structure.
   a) Operations b) Storage Structures
   c) Algorithms d) None of above

4) _____ is very useful in situation when data have to stored and then retrieved in reverse order.
   a) Stack b) Queue
   c) List d) Link list

5) Which data structure allows deleting data elements from and inserting at rear?
   a) Stacks b) Queues
   c) Dequeues d) Binary search tree

6) Which of the following is non-liner data structure?
   a) Stacks b) List
   c) Strings d) Trees

7) Which of the following data structure is linear type?
   a) Graph b) Trees
   c) Binary tree d) Stack

8) 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
   c) Priority queues d) Stack

9) Which data structure is used in breadth first search of a graph to hold nodes?
   a) Stack b) Queue
   c) Tree d) Array

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
   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) Linked list
   c) Traversed link
   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
   b) Red-black tree
   c) Lemma tree
   d) None of the above

Seat No.	

Set **R**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) Explain Quick sort with example.
b) Write a program for linear search & explain.
c) Explain DFS & BFS traverse with example.

Seat No.	

Set **S**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday, 17-12-2019 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 Page No.3
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. 14

1) Which of the following is non-liner data structure?
   a) Stacks b) List
   c) Strings d) Trees

2) Which of the following data structure is linear type?
   a) Graph b) Trees
   c) Binary tree d) Stack

3) 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
   c) Priority queues d) Stack

4) Which data structure is used in breadth first search of a graph to hold nodes?
   a) Stack b) Queue
   c) Tree d) Array

5) 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

6) 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

7) A sequence of data structures connected together through links are known to be _____.
   a) Connected list b) Linked list
   c) Traversed link d) Compound List

8) 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

9) 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

10) _____ level is where the model becomes compatible executable code.
   a) Abstract level
   b) Application level
   c) Implementation level
   d) AII of the above

11) Stack is also called as _____.
   a) Last in first out
   b) First in last out
   c) Last in last out
   d) First in first out

12) _____ is not the component of data structure.
   a) Operations
   b) Storage Structures
   c) Algorithms
   d) None of above

13) _____ is very useful in situation when data have to stored and then retrieved in reverse order.
   a) Stack
   b) Queue
   c) List
   d) Link list

14) Which data structure allows deleting data elements from and inserting at rear?
   a) Stacks
   b) Queues
   c) Dequeues
   d) Binary search tree

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Seat No.	

Set S

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DATA STRUCTURES USING 'C'

Day & Date: Tuesday,17-12-2019 Max. Marks: 56
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. **12**

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. **16**

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. **12**

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. **16**

a) Explain Quick sort with example.
b) Write a program for linear search & explain.
c) Explain DFS & BFS traverse with example.

Seat No.	

Set **P**

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 Max. Marks: 70
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 indicate full marks.
3) Assume suitable data if necessary.
4) Use of electronic component datasheet is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option **14**

1) A direct coupled amplifier is also called as _____.
   a) RC coupled amplifier b) DC amplifier
   c) AC amplifier d) None of these

2) Darlington pair consists of two _____ cascaded.
   a) CB,CB b) CE,CE
   c) CC,CC d) CE,CC

3) 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

4) 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

5) A transconductance amplifier has _____ input resistance and _____ output resistance.
   a) Zero, Infinity b) Zero, Zero
   c) Infinity, Zero d) Infinity, Infinity

6) 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

7) 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

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

13) A sine wave can be converted into square wave using _____.
   a) Astable multivibrator b) Monostable multivibrator
   c) Rectifier d) Schmitt trigger

14) IC 555 can act as divide by n network in _____ mode.
   a) Astable b) Monostable
   c) Bostable d) All of these

Seat No.	

Set **P**

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 Max. Marks: 56
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: **16**

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: **12**

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: **16**

a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use Iadj=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: **12**

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.

Seat No.	

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 Max. Marks: 70
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 indicate full marks.
3) Assume suitable data if necessary.
4) Use of electronic component datasheet is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option **14**

1) Pre regulator circuit is _____.
   a) Constant voltage source
   b) Constant current source
   c) Stability factor improvement circuit
   d) Both b & c

2) 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

3) 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

4) Schmitt trigger is _____.
   a) Amplifier b) Rectifier
   c) Oscillator d) All of these

5) Power dissipated in case of astable multivibrator is due to _____.
   a) Vcc b) Vcc, Rc
   c) Rc d) None

6) A sine wave can be converted into square wave using _____.
   a) Astable multivibrator b) Monostable multivibrator
   c) Rectifier d) Schmitt trigger

7) IC 555 can act as divide by n network in _____ mode.
   a) Astable b) Monostable
   c) Bostable d) All of these

8) A direct coupled amplifier is also called as _____.
   a) RC coupled amplifier b) DC amplifier
   c) AC amplifier d) None of these

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

Seat No.	

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 Max. Marks: 56
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: **16**

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: **12**

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: **16**

a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use Iadj=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: **12**

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.

Seat No.	

Set **R**

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 Max. Marks: 70
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 indicate full marks.
3) Assume suitable data if necessary.
4) Use of electronic component datasheet is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option **14**

1) A transconductance amplifier has _____ input resistance and _____ output resistance.
   a) Zero, Infinity b) Zero, Zero
   c) Infinity, Zero d) Infinity, Infinity

2) 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

3) 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

4) Pre regulator circuit is _____.
   a) Constant voltage source
   b) Constant current source
   c) Stability factor improvement circuit
   d) Both b & c

5) 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

6) 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

7) Schmitt trigger is _____.
   a) Amplifier b) Rectifier
   c) Oscillator d) All of these

8) Power dissipated in case of astable multivibrator is due to _____.
   a) Vcc b) Vcc, Rc
   c) Rc d) None

9) A sine wave can be converted into square wave using _____.
   a) Astable multivibrator b) Monostable multivibrator
   c) Rectifier d) Schmitt trigger

10) IC 555 can act as divide by n network in _____ mode.
   a) Astable b) Monostable
   c) Bostable d) All of these

11) A direct coupled amplifier is also called as _____.
   a) RC coupled amplifier b) DC amplifier
   c) AC amplifier d) None of these

12) Darlington pair consists of two _____ cascaded.
   a) CB,CB b) CE,CE
   c) CC,CC d) CE,CC

13) 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

14) 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

Seat No.	

Set **R**

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 Max. Marks: 56
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: **16**

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: **12**

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: **16**

a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use Iadj=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: **12**

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.

Seat No.	

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 Max. Marks: 70
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 Page no.3 each question carries 1 mark.
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 Marks: 14

Q.1 Choose the correct option **14**

1) 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

2) Schmitt trigger is _____.
   a) Amplifier b) Rectifier
   c) Oscillator d) All of these

3) Power dissipated in case of astable multivibrator is due to _____.
   a) Vcc b) Vcc, Rc
   c) Rc d) None

4) A sine wave can be converted into square wave using _____.
   a) Astable multivibrator b) Monostable multivibrator
   c) Rectifier d) Schmitt trigger

5) IC 555 can act as divide by n network in _____ mode.
   a) Astable b) Monostable
   c) Bostable d) All of these

6) A direct coupled amplifier is also called as _____.
   a) RC coupled amplifier b) DC amplifier
   c) AC amplifier d) None of these

7) Darlington pair consists of two _____ cascaded.
   a) CB,CB b) CE,CE
   c) CC,CC d) CE,CC

8) 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

9) 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

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 _____.
   a) It works at very high frequency
   b) It produces stable oscillation
   c) It produces high output swing
   d) None of these

12) 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

13) Pre regulator circuit is _____.
   a) Constant voltage source
   b) Constant current source
   c) Stability factor improvement circuit
   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

SLR-FM-680

Seat No.	

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 Max. Marks: 56
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: **16**

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: **12**

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: **16**

a) Design a negative regulator to provide 4V to 16V regulated output using variable regulator IC. Use Iadj=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: **12**

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.

Seat No.	

Set **P**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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 Marks: 14

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

1) Thermal noise voltage in resistor R is proportional to _____.
   a) $\sqrt{R}$ b) R
   c) R^2 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
   c) Zener diode d) Low pass filter

4) In TV transmission, picture signal is _____ modulated.
   a) Frequency b) Phase
   c) Amplitude d) All of these

5) 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

6) What is the ratio of modulating power to total power at 100% modulation?
   a) 1:3 b) 1:2
   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.
   a) 12 b) 24
   c) 15 d) 13.55

8) 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

9) Which type of noise does not occur in transistor?
   a) Shot noise b) Flicker noise
   c) Partition noise d) Resistance noise

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

11) In FM system, if the depth of modulation is doubled, the output power _____.
   a) increased by factor of $\sqrt{2}$
   b) increased by factor of $\sqrt{3}$
   c) increased by factor of 2
   d) remains at unmodulated value

12) Frequency of dialing tone is _____.
   a) 50Hz
   b) 33Hz
   c) 800Hz
   d) 133Hz

13) A folded dipole consists of _____.
   a) Single element
   b) Two elements
   c) Three elements
   d) Four elements

14) Strowger switching system is _____ type of telephone system.
   a) electronic
   b) Manual
   c) automatic
   d) Electromechanical

SLR-FM-681

Seat No.	

Set P

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

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

Section – I

Q.2 Attempt any four of the following questions. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **Q**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) Which type of noise does not occur in transistor?
   a) Shot noise b) Flicker noise
   c) Partition noise d) Resistance noise

3) 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

4) In FM system, if the depth of modulation is doubled, the output power _____.
   a) increased by factor of $\sqrt{2}$ b) increased by factor of $\sqrt{3}$
   c) increased by factor of 2 d) remains at unmodulated value

5) Frequency of dialing tone is _____.
   a) 50Hz b) 33Hz
   c) 800Hz d) 133Hz

6) A folded dipole consists of _____.
   a) Single element b) Two elements
   c) Three elements d) Four elements

7) Strowger switching system is _____ type of telephone system.
   a) electronic b) Manual
   c) automatic d) Electromechanical

8) Thermal noise voltage in resistor R is proportional to _____.
   a) $\sqrt{R}$ b) R
   c) R^2 d) independent of R

9) Standard intermediate frequency used for AM receiver is _____.
   a) 455 MHz b) 455 KHz
   c) 455 Hz d) None of these

10) 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

11) In TV transmission, picture signal is _____ modulated.
   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?
   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) 24
   c) 15
   d) 13.55

Seat No.	

Set **Q**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

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

Section – I

Q.2 Attempt any four of the following questions. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **R**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) What is the ratio of modulating power to total power at 100% modulation?
   a) 1:3 b) 1:2
   c) 2:3 d) 3:2

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

6) 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

7) In FM system, if the depth of modulation is doubled, the output power _____.
   a) increased by factor of $\sqrt{2}$ b) increased by factor of $\sqrt{3}$
   c) increased by factor of 2 d) remains at unmodulated value

8) Frequency of dialing tone is _____.
   a) 50Hz b) 33Hz
   c) 800Hz d) 133Hz

9) A folded dipole consists of _____.
   a) Single element b) Two elements
   c) Three elements d) Four elements

10) Strowger switching system is _____ type of telephone system.
   a) electronic b) Manual
   c) automatic d) Electromechanical

11) Thermal noise voltage in resistor R is proportional to _____.
   a) $\sqrt{R}$ b) R
   c) R^2 d) independent of R

12) Standard intermediate frequency used for AM receiver is _____.
   a) 455 MHz b) 455 KHz
   c) 455 Hz d) None of these

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 b) Phase
   c) Amplitude d) All of these

Seat No.	

Set **R**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

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

Section – I

Q.2 Attempt any four of the following questions. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **S**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
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 Marks: 14

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

1) 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

2) In FM system, if the depth of modulation is doubled, the output power _____.
   a) increased by factor of $\sqrt{2}$ b) increased by factor of $\sqrt{3}$
   c) increased by factor of 2 d) remains at unmodulated value

3) Frequency of dialing tone is _____.
   a) 50Hz b) 33Hz
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11) What is the ratio of modulating power to total power at 100% modulation?
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12) 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

13) 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

14) Which type of noise does not occur in transistor?
   a) Shot noise
   b) Flicker noise
   c) Partition noise
   d) Resistance noise

SLR-FM-681

Seat No.	

Set S

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics and Telecommunication Engineering
ANALOG COMMUNICATION

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

Section – I

Q.2 Attempt any four of the following questions. **16**

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. **12**

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. **16**

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. **12**

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.

Seat No.	

Set **P**

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer book.
2) 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 sentence. **14**

1) In an open loop control system _____.
   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)

3) Zero initial condition for a system means _____.
   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 b) Velocity
   c) Displacement d) Mass

5) The type 1 system has _____ at the origin.
   a) no pole b) net pole
   c) simple pole d) two poles

6) When two blocks connected in parallel, resultant block is the _____ of individual block.
   a) Product b) Division
   c) Sum d) Subtraction

7) The first two rows of Routh tabulation of a third order system are
   S^3 I 2 2
   S^2 I 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=±2j
   d) None of the these

8) 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

9) In a type-I system, the steady state acceleration error is _____.
   a) Zero b) Unity
   c) Infinity d) None of these

10) In critically damped system, the damping factor of the system is _____.
   a) Zero b) Unity
   c) Less than unity d) greater than unity

11) The addition of zero in the transfer function causes _____.
   a) Phase lead compensation b) Phase lag compensation
   c) Lag- lead compensation d) None of these

12) The phase shift of the second order system with transfer function $1/S^2$ is ____.
   a) 180^0 b) -180^0
   c) 0^0 d) 90^0

13) Starting point of Root Locus are _____.
   a) open loop poles b) close loop poles
   c) open loop zeros d) close loop zeros

14) A feedback control system has $G(s)H(s) = \frac{10}{s(s+2)}$, the ramp error constant is _____.
   a) 10 b) 2
   c) 5 d) None

Seat No.	

Set **P**

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

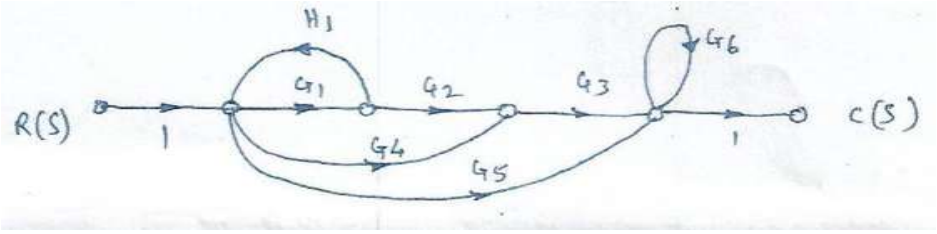
Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.

SECTION I

Q.2 Attempt any four: **16**

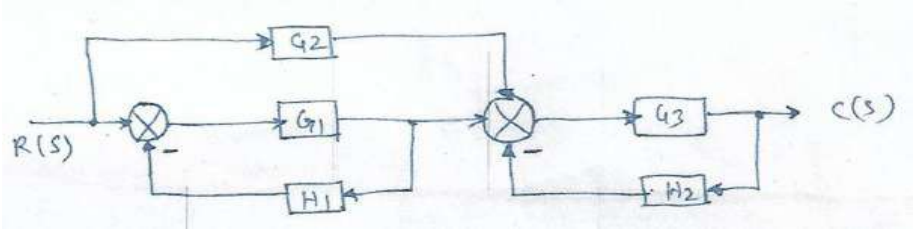
a) Explain with block diagram Liquid level control system.
b) Differentiate between open loop and closed loop systems.
c) What is transfer function? Derive transfer function of closed loop control system.
d) Explain rules for block diagram reduction.
e) Define relative stability and conditional stability.

Q.3 a) Find the transfer function of the system shown below using Mason's gain formula. **06**



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 **16**

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.

$$\mathrm{T}(s) = \frac{25}{s^2 + 6s + 25}$$

d) Explain how centroid and breakaway points are calculated in root locus.

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. **12**

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) $1+4t+t^2/2$

SLR-FM-682

Seat No.	

Set Q

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer book.
2) 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 sentence. **14**

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 _____.
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   c) Infinity d) None of these

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5) The phase shift of the second order system with transfer function $1/S^2$ is ____.
   a) 180^0 b) -180^0
   c) 0^0 d) 90^0

6) Starting point of Root Locus are _____.
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8) In an open loop control system _____.
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   b) output is dependent on control input
   c) only system parameters have effect on the control output
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9) _____ has tendency to oscillate.
   a) Open loop
   b) Closed loop
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   d) Neither a) nor b)

10) Zero initial condition for a system means _____.
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   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 _____.
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   b) Velocity
   c) Displacement
   d) Mass

12) The type 1 system has _____ at the origin.
   a) no pole
   b) net pole
   c) simple pole
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13) When two blocks connected in parallel, resultant block is the _____ of individual block.
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   b) Division
   c) Sum
   d) Subtraction

14) The first two rows of Routh tabulation of a third order system are

S^3	I 2	2
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   a) The characteristic equation has one root in right half s-plane
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Seat No.	

Set **Q**

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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: **16**

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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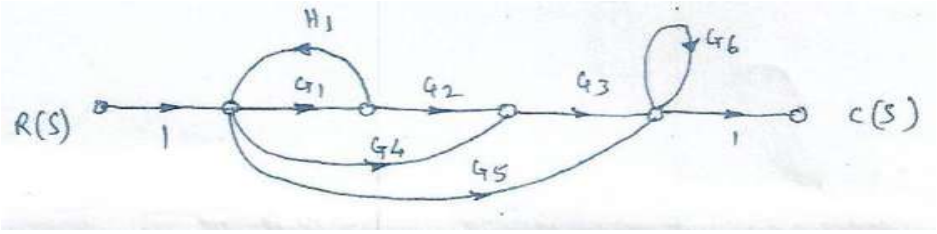

b) Solve any ONE

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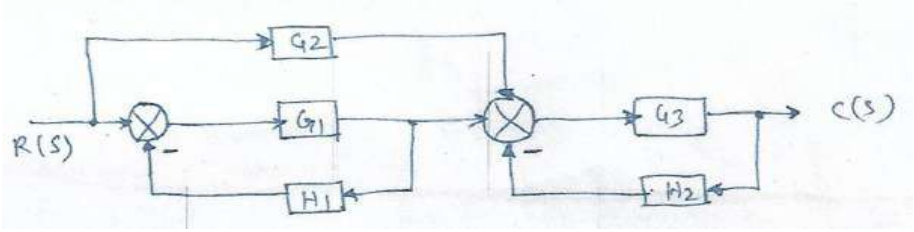

2) A unity feedback control system has an open loop transfer function

$$x = \frac{k}{(S+1)^3(S+4)}$$

Determine the range of value of k for the closed loop system be stable.

SECTION II

Q.4 Attempt any four **16**

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.

$$\mathrm{T}(s) = \frac{25}{s^2 + 6s + 25}$$

d) Explain how centroid and breakaway points are calculated in root locus.

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. **12**

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) $1+4t+t^2/2$

SLR-FM-682

Seat No.	

Set R

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer book.
2) 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 sentence. **14**

1) The type 1 system has _____ at the origin.
   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
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3) The first two rows of Routh tabulation of a third order system are
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4) Bode plot of the constant is a _____.
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5) In a type-I system, the steady state acceleration error is _____.
   a) Zero b) Unity
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   a) Momentum b) Velocity
   c) Displacement d) Mass

Seat No.	

Set **R**

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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: **16**

a) Explain with block diagram Liquid level control system.
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c) What is transfer function? Derive transfer function of closed loop control system.
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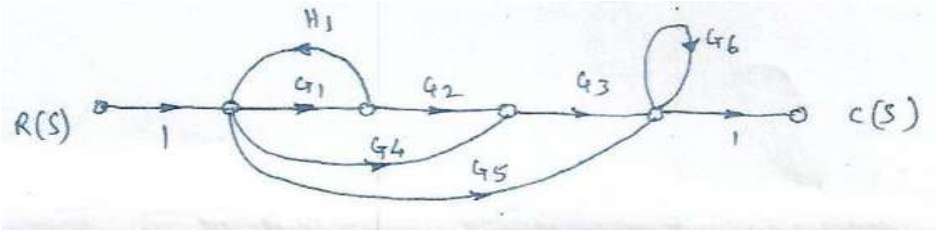
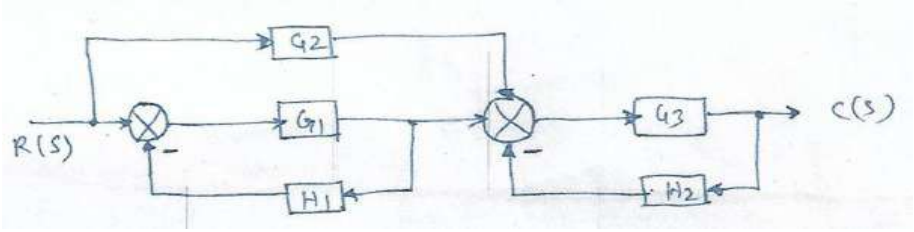
e) Define relative stability and conditional stability.

Q.3 a) Find the transfer function of the system shown below using Mason's gain formula. **06**



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 **16**

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.

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d) Explain how centroid and breakaway points are calculated in root locus.

e) Determine the steady state error of given system For Input is r(t)= t^2

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1) Type of system
2) Error co-efficients
3) $1+4t+t^2/2$

Seat No.	

Set **S**

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

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

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Seat No.	

Set **S**

S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019
ELECTRONICS & TELECOMMUNICATION ENGINEERING
CONTROL SYSTEMS

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
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SECTION I

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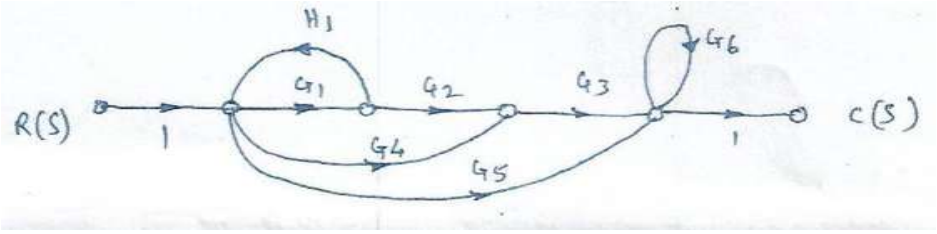

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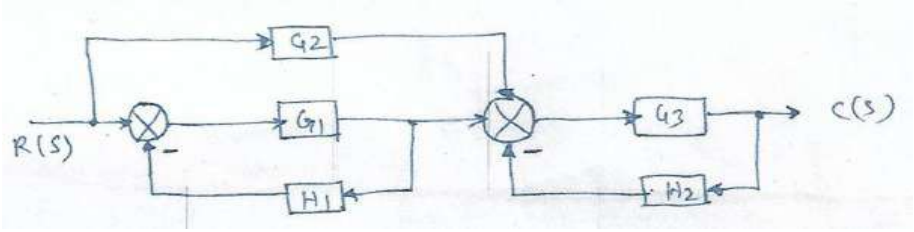

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$$x = \frac{k}{(S+1)^3(S+4)}$$

Determine the range of value of k for the closed loop system be stable.

SECTION II

Q.4 Attempt any four **16**

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$$G(s)H(s) = \frac{10(s+1)}{s^2(s+2)(s+10)}$$

1) Type of system
2) Error co-efficients
3) $1+4t+t^2/2$

Seat No.	

Set **P**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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 _____.
   a) 10 MHz b) 1 MHz
   c) infinite d) 1 KHz

4) Slew rate of the IC 741 is _____.
   a) 0.5 V/μsec b) 5 V/ μsec
   c) 150 V/μsec d) None

5) Gain of opamp is decided by following circuit.
   a) DIBO Amplifier b) Current Mirror
   c) Level Shifter d) None

6) Which of the following is the example of comparator?
   a) ZCD b) Schmitt trigger
   c) Window detector d) All

7) Schmitt Trigger is also called as _____.
   a) Square wave generator b) Squaring circuit
   c) Triangular generator d) None

8) The gain for wein bridge oscillator at resonance is given by _____
   a) 4 b) 29
   c) 3 d) 1.16

9) Which of the following is sinusoidal oscillator?
   a) Wein bridge b) Phase shift
   c) Quadrature d) All of above

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 b) Two quadrant
   c) Four quadrant d) All above

12) Using log amplifier we can perform
   a) $\log_n (x)$ b) $\log_{10} (x)$
   c) sinh (x) d) all above

13) Butterworth filter is also known as_____ filter.
   a) Flat flat b) flat ripple
   c) ripple rippled d) none

14) Gain of opamp as buffer is _____.
   a) zero b) infinite
   c) unity d) less than one

Seat No.	

Set **P**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 **16**

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. **12**

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.

Seat No.	

Set **Q**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

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 gain for wein bridge oscillator at resonance is given by _____
   a) 4 b) 29
   c) 3 d) 1.16

2) Which of the following is sinusoidal oscillator?
   a) Wein bridge b) Phase shift
   c) Quadrature d) All of above

3) The advantage of active filter is _____.
   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 d) All above

5) Using log amplifier we can perform
   a) $\log_n (x)$ b) $\log_{10} (x)$
   c) sinh (x) d) all above

6) Butterworth filter is also known as_____ filter.
   a) Flat flat b) flat ripple
   c) ripple rippled d) none

7) Gain of opamp as buffer is _____.
   a) zero b) infinite
   c) unity d) less than one

8) For Summing amplifier the ratio of R_f/r_1 must be _____.
   a) Zero b) One
   c) Infinite d) Less than one

9) When square wave signal is input to the differentiator then output is _____.
   a) Triangular b) Spikes
   c) Square wave d) None

10) Gain bandwidth product of IC 741 is _____.
   a) 10 MHz b) 1 MHz
   c) infinite d) 1 KHz

11) Slew rate of the IC 741 is _____.
   a) 0.5 V/μsec b) 5 V/ μsec
   c) 150 V/μsec d) None

12) Gain of opamp is decided by following circuit.
   a) DIBO Amplifier b) Current Mirror
   c) Level Shifter d) None

13) Which of the following is the example of comparator?
   a) ZCD b) Schmitt trigger
   c) Window detector d) All

14) Schmitt Trigger is also called as _____.
   a) Square wave generator b) Squaring circuit
   c) Triangular generator d) None

Seat No.	

Set **Q**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 **16**

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. **12**

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.

Seat No.	

Set **R**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Gain of opamp is decided by following circuit.
   a) DIBO Amplifier b) Current Mirror
   c) Level Shifter d) None

2) Which of the following is the example of comparator?
   a) ZCD b) Schmitt trigger
   c) Window detector d) All

3) Schmitt Trigger is also called as _____.
   a) Square wave generator b) Squaring circuit
   c) Triangular generator d) None

4) The gain for wein bridge oscillator at resonance is given by _____
   a) 4 b) 29
   c) 3 d) 1.16

5) Which of the following is sinusoidal oscillator?
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6) The advantage of active filter is _____.
   a) Gain adjustment flexibility
   b) Frequency adjustment flexibility
   c) Both a) and b)
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7) Analog multipliers are available as _____.
   a) One quadrant b) Two quadrant
   c) Four quadrant d) All above

8) Using log amplifier we can perform
   a) $\log_n (x)$ b) $\log_{10} (x)$
   c) sinh (x) d) all above

9) Butterworth filter is also known as_____ filter.
   a) Flat flat b) flat ripple
   c) ripple rippled d) none

10) Gain of opamp as buffer is _____.
   a) zero b) infinite
   c) unity d) less than one

11) For Summing amplifier the ratio of R_f/r_1 must be _____.
   a) Zero b) One
   c) Infinite d) Less than one

12) When square wave signal is input to the differentiator then output is _____.
   a) Triangular b) Spikes
   c) Square wave d) None

13) Gain bandwidth product of IC 741 is _____.
   a) 10 MHz b) 1 MHz
   c) infinite d) 1 KHz

14) Slew rate of the IC 741 is _____.
   a) 0.5 V/µsec b) 5 V/ µsec
   c) 150 V/µsec d) None

Seat No.	

Set **R**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 **16**

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. **12**

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.

Seat No.	

Set **S**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

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
   c) Four quadrant d) All above

3) Using log amplifier we can perform
   a) $\log_n (x)$ b) $\log_{10} (x)$
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4) Butterworth filter is also known as_____ filter.
   a) Flat flat b) flat ripple
   c) ripple rippled d) none

5) Gain of opamp as buffer is _____.
   a) zero b) infinite
   c) unity d) less than one

6) For Summing amplifier the ratio of R_f/r_1 must be _____.
   a) Zero b) One
   c) Infinite d) Less than one

7) When square wave signal is input to the differentiator then output is _____.
   a) Triangular b) Spikes
   c) Square wave d) None

8) Gain bandwidth product of IC 741 is _____.
   a) 10 MHz b) 1 MHz
   c) infinite d) 1 KHz

9) Slew rate of the IC 741 is _____.
   a) 0.5 V/μsec b) 5 V/ μsec
   c) 150 V/μsec d) None

10) Gain of opamp is decided by following circuit.
   a) DIBO Amplifier b) Current Mirror
   c) Level Shifter d) None

11) Which of the following is the example of comparator?
   a) ZCD b) Schmitt trigger
   c) Window detector d) All

12) Schmitt 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 resonance 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

Seat No.	

Set **S**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
LINEAR INTEGRATED CIRCUITS

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
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. **16**

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. **12**

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 **16**

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. **12**

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.

Seat No.	

Set **P**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives given below and rewrite the sentence. 14

1) The discrete time signal $x(n) = (-1)^n$ is periodic with fundamental period.
   a) 6 b) 4
   c) 2 d) 0

2) Periodic signals are _____.
   a) $x(t + T) = x(t)$ b) $x(t - T) = x(t)$
   c) $x(n + mN) = x(n)$ d) All above

3) A useful property of the unit impulse $\delta(t)$ is that _____.
   a) $\delta(at)$ b) $\delta(at) = \delta(t)$
   c) $\delta(at) = \frac{1}{a}\delta(t)$ d) $\delta(at) = [\delta(t)]^a$

4) 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

5) 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
   c) Nonlinear and unstable d) Nonlinear and stable

6) 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

7) 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

8) The frequency of a continuous time signal $x(t)$ changes on transformation from $x(t) \text{to } x(\alpha t), \alpha > 1$ by a factor _____.
   a) α b) $1/\alpha$
   c) α^2 d) None

9) Fourier spectrum (transform) of non-periods signal will have _____.
   a) Magnitude spectrum b) Phase spectrum
   c) Both a & b d) Constant value

10) Inverse FT of 1 is _____.
   a) u(t) b) $\partial(t)$
   c) 0 d) Infinite

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
   c) function $x(t)$ is absolutely integrable over one period
   d) All of above

12) ROC of $x(n)$ contains _____.
   a) Poles
   b) Zeros
   c) No poles
   d) No zeros

13) ROC of ZT of unit step seq is _____.
   a) $|Z| < 1$
   b) $|Z| > 1$
   c) Real part of $Z > 0$
   d) $|Z| = 0$

14) Inverse ZT of X(Z/a) _____.
   a) $x(n/a)$
   b) $x(n)/a$
   c) $a^n x(n)$
   d) $ax(n)$

Seat No.	

Set P

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **12**

a) Find even and odd components of the following signals.
1) $x(t) = 1 + t + 3t^2 + 5t^3 + 9t^4$
2) $x(t) = 1 + t\cos(t) + t^2\sin(t) + t^3\sin(t)\cos(t)$

b) Explain operations performed on independent variables.

c) Determine whether the following signal is periodic or non-periodic. If periodic find its fundamental period.
1) $\sin^3(2t)$

d) Explain properties of LTI Systems.

e) Draw Direct form-I and Direct form-II implementation for the following LTI system.
$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$

Q.3 Attempt any Two of the following questions. **16**

a) Verify the general property of system for the following system.
$\frac{d}{dt}y(t) + ty(t) = x(t)$

b) 1) Find the step response of the following system h(t) = t u(t). Justify also whether LTI system is stable or not stable.
2) State and prove the properties of convolution integral.

c) Perform the convolution operation of two function in time domain.
$h(t) = e^{-2t}\,u(t)$ and $x(t) = e^{-t}\,u(t)$

Section – II

Q.4 Attempt any four of the following questions. **12**

a) State & explain sampling theorem.

b) Explain modulation property of FT.

c) Find ZT & sketch ROC
$x(n) = (0.6)^n u(n) + (0.4)^n u(n)$

d) Find ZT of $x(n) = u(n+1)u(n)$

e) Find inverse $ZT\ of\ X(Z) = \frac{z}{2z^2-3z+1}$ & $ROC\ is\ |Z| > 1$

Q.5 Attempt any Two of the following questions. **16**

a) Consider analog signal $x(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$.
i) What is sampling rate?
ii) For this signal assuming that signal is sampled using fs=5000Hz. What is DT signal?

b) Determine FT of $x(t) = e^{-a|t|}$ & plot magnitude spectrum.

c) Find ZT of $x(n) = n^2 u(n)$

Seat No.	

Set **Q**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives given below and rewrite the sentence. 14

1) The frequency of a continuous time signal $x(t)$ changes on transformation from $x(t) \text{ to } x(\alpha t), \alpha > 1$ by a factor _____.
   a) α b) $1/\alpha$
   c) α^2 d) None

2) Fourier spectrum (transform) of non-periods signal will have _____.
   a) Magnitude spectrum b) Phase spectrum
   c) Both a & b d) Constant value

3) Inverse FT of 1 is _____.
   a) u(t) b) $\partial(t)$
   c) 0 d) Infinite

4) 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

5) ROC of $x(n)$ contains _____.
   a) Poles b) Zeros
   c) No poles d) No zeros

6) ROC of ZT of unit step seq is _____.
   a) $|Z| < 1$ b) $|Z| > 1$
   c) Real part of $Z > 0$ d) $|Z| = 0$

7) Inverse ZT of X(Z/a) _____.
   a) $x(n/a)$ b) $x(n)/a$
   c) $a^n x(n)$ d) $ax(n)$

8) The discrete time signal $x(n) = (-1)^n$ is periodic with fundamental period.
   a) 6 b) 4
   c) 2 d) 0

9) Periodic signals are _____.
   a) $x(t + T) = x(t)$ b) $x(t - T) = x(t)$
   c) $x(n + mN) = x(n)$ d) All above

10) A useful property of the unit impulse $\delta\,(t)$ is that _____.
   a) $\delta(at)$
   b) $\delta(at) = \delta(t)$
   c) $\delta(at) = \frac{1}{a}\delta(t)$
   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
   c) 2E
   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
   c) Nonlinear and unstable
   d) Nonlinear and stable

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   a) Linear for any value of b
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   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

Seat No.	

Set **Q**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **12**

a) Find even and odd components of the following signals.
1) $x(t) = 1 + t + 3t^2 + 5t^3 + 9t^4$
2) $x(t) = 1 + t\cos(t) + t^2\sin(t) + t^3\sin(t)\cos(t)$

b) Explain operations performed on independent variables.

c) Determine whether the following signal is periodic or non-periodic. If periodic find its fundamental period.
1) $\sin^3(2t)$

d) Explain properties of LTI Systems.

e) Draw Direct form-I and Direct form-II implementation for the following LTI system.
$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$

Q.3 Attempt any Two of the following questions. **16**

a) Verify the general property of system for the following system.
$\frac{d}{dt}y(t) + ty(t) = x(t)$

b) 1) Find the step response of the following system h(t) = t u(t). Justify also whether LTI system is stable or not stable.
2) State and prove the properties of convolution integral.

c) Perform the convolution operation of two function in time domain.
$h(t) = e^{-2t}\,u(t)$ and $x(t) = e^{-t}\,u(t)$

Section – II

Q.4 Attempt any four of the following questions. **12**

a) State & explain sampling theorem.

b) Explain modulation property of FT.

c) Find ZT & sketch ROC
$x(n) = (0.6)^n u(n) + (0.4)^n u(n)$

d) Find ZT of $x(n) = u(n+1)u(n)$

e) Find inverse $ZT\ of\ X(Z) = \frac{z}{2z^2-3z+1}$ & $ROC\ is\ |Z| > 1$

Q.5 Attempt any Two of the following questions. **16**

a) Consider analog signal $x(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$.
i) What is sampling rate?
ii) For this signal assuming that signal is sampled using fs=5000Hz. What is DT signal?

b) Determine FT of $x(t) = e^{-a|t|}$ & plot magnitude spectrum.

c) Find ZT of $x(n) = n^2 u(n)$

Seat No.	

Set **R**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives given below and rewrite the sentence. 14

1) 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
   c) Nonlinear and unstable d) Nonlinear 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) α b) $1/\alpha$
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   c) $\delta(at) = \frac{1}{a}\delta(t)$ d) $\delta(at) = [\delta(t)]^a$

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

Seat No.	

Set **R**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **12**

a) Find even and odd components of the following signals.
1) $x(t) = 1 + t + 3t^2 + 5t^3 + 9t^4$
2) $x(t) = 1 + t\cos(t) + t^2\sin(t) + t^3\sin(t)\cos(t)$

b) Explain operations performed on independent variables.

c) Determine whether the following signal is periodic or non-periodic. If periodic find its fundamental period.
1) $\sin^3(2t)$

d) Explain properties of LTI Systems.

e) Draw Direct form-I and Direct form-II implementation for the following LTI system.
$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$

Q.3 Attempt any Two of the following questions. **16**

a) Verify the general property of system for the following system.
$\frac{d}{dt}y(t) + ty(t) = x(t)$

b) 1) Find the step response of the following system h(t) = t u(t). Justify also whether LTI system is stable or not stable.
2) State and prove the properties of convolution integral.

c) Perform the convolution operation of two function in time domain.
$h(t) = e^{-2t}\,u(t)$ and $x(t) = e^{-t}\,u(t)$

Section – II

Q.4 Attempt any four of the following questions. **12**

a) State & explain sampling theorem.

b) Explain modulation property of FT.

c) Find ZT & sketch ROC
$x(n) = (0.6)^n u(n) + (0.4)^n u(n)$

d) Find ZT of $x(n) = u(n+1)u(n)$

e) Find inverse $ZT\ of\ X(Z) = \frac{z}{2z^2-3z+1}$ & $ROC\ is\ |Z| > 1$

Q.5 Attempt any Two of the following questions. **16**

a) Consider analog signal $x(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$.
i) What is sampling rate?
ii) For this signal assuming that signal is sampled using fs=5000Hz. What is DT signal?

b) Determine FT of $x(t) = e^{-a|t|}$ & plot magnitude spectrum.

c) Find ZT of $x(n) = n^2 u(n)$

Seat No.	

Set **S**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives given below and rewrite the sentence. 14

1) Inverse FT of 1 is _____.
   a) u(t) b) $\partial(t)$
   c) 0 d) Infinite

2) Dirichlet conditions for periodic signals are in each period.
   a) function $\mathrm{x(t)}$ has only finite number of maxima & minima
   b) function $\mathrm{x(t)}$ has finite number of discontinuities
   c) function $\mathrm{x(t)}$ is absolutely integrable over one period
   d) All of above

3) ROC of $\mathrm{x(n)}$ contains _____.
   a) Poles b) Zeros
   c) No poles d) No zeros

4) ROC of ZT of unit step seq is _____.
   a) $|Z| < 1$ b) $|Z| > 1$
   c) Real part of $\mathrm{Z} > 0$ d) $|Z| = 0$

5) Inverse ZT of X(Z/a) _____.
   a) $\mathrm{x(n/a)}$ b) $\mathrm{x(n)/a}$
   c) $\mathrm{a^n x(n)}$ d) $\mathrm{ax(n)}$

6) The discrete time signal $\mathrm{x(n)} = (-1)^{\mathrm{n}}$ is periodic with fundamental period.
   a) 6 b) 4
   c) 2 d) 0

7) Periodic signals are _____.
   a) $\mathrm{x(t+T) = x(t)}$ b) $\mathrm{x(t-T) = x(t)}$
   c) $\mathrm{x(n+mN) = x(n)}$ d) All above

8) A useful property of the unit impulse $\delta\,(\mathrm{t})$ is that _____.
   a) $\delta(\mathrm{at})$ b) $\delta(\mathrm{at}) = \delta(\mathrm{t})$
   c) $\delta(\mathrm{at}) = \frac{1}{\mathrm{a}}\delta(\mathrm{t})$ d) $\delta(\mathrm{at}) = [\delta(\mathrm{t})]^{\mathrm{a}}$

9) 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

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.
a) Linear and unstable
b) Linear and stable
c) Nonlinear and unstable
d) Nonlinear and stable

11) 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

12) 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

13) 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) α
b) $1/\alpha$
c) α^2
d) None

14) Fourier spectrum (transform) of non-periods signal will have _____.
a) Magnitude spectrum
b) Phase spectrum
c) Both a & b
d) Constant value

Seat No.	

Set **S**

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

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
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. **12**

a) Find even and odd components of the following signals.
1) $x(t) = 1 + t + 3t^2 + 5t^3 + 9t^4$
2) $x(t) = 1 + t\cos(t) + t^2\sin(t) + t^3\sin(t)\cos(t)$

b) Explain operations performed on independent variables.

c) Determine whether the following signal is periodic or non-periodic. If periodic find its fundamental period.
1) $\sin^3(2t)$

d) Explain properties of LTI Systems.

e) Draw Direct form-I and Direct form-II implementation for the following LTI system.
$\frac{d}{dt}y(t) + 10y(t) = 2x(t)$

Q.3 Attempt any Two of the following questions. **16**

a) Verify the general property of system for the following system.
$\frac{d}{dt}y(t) + ty(t) = x(t)$

b) 1) Find the step response of the following system h(t) = t u(t). Justify also whether LTI system is stable or not stable.
2) State and prove the properties of convolution integral.

c) Perform the convolution operation of two function in time domain.
$h(t) = e^{-2t}\,u(t)$ and $x(t) = e^{-t}\,u(t)$

Section – II

Q.4 Attempt any four of the following questions. **12**

a) State & explain sampling theorem.

b) Explain modulation property of FT.

c) Find ZT & sketch ROC
$x(n) = (0.6)^n u(n) + (0.4)^n u(n)$

d) Find ZT of $x(n) = u(n+1)u(n)$

e) Find inverse $ZT\ of\ X(Z) = \frac{z}{2z^2-3z+1}$ & $ROC\ is\ |Z| > 1$

Q.5 Attempt any Two of the following questions. **16**

a) Consider analog signal $x(t) = 3\cos 2000\pi t + 5\sin 6000\pi t + 10\cos 1000\pi t$.
i) What is sampling rate?
ii) For this signal assuming that signal is sampled using fs=5000Hz. What is DT signal?

b) Determine FT of $x(t) = e^{-a|t|}$ & plot magnitude spectrum.

c) Find ZT of $x(n) = n^2 u(n)$

Seat No.	

Set P

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data if necessary.
3) Figure must be draw wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A field line and an equipotential surface are _____.
   a) always parallel b) always at 90^o
   c) inclined at any angle d) none of the above

2) Which of the following is true for electrostatics?
   a) $E = -\nabla V$ b) $\nabla^2 \mathrm{V} = 0$
   c) Both (a) and (b) d) None of these

3) Potential energy of a test charge, when moved from a lower potential point to a higher potential point _____.
   a) Remains the same b) Increases
   c) Decreases d) Becomes zero

4) As per Gauss's Law, the total electric flux Ψ through a closed surface and the total charge Q_{en} that surface are related as _____.
   a) $\oint D.ds = Q$ b) $\Psi = Q_{en}$
   c) Both a & b d) $\oint D.ds = 0$

5) The capacitance of isolated capacitor is _____.
   a) $4\pi\varepsilon_0\varepsilon_r a$ b) $\frac{4\pi\varepsilon}{\frac{1}{a}-\frac{1}{b}}$
   c) $4\pi\varepsilon_0\varepsilon_r(a-b)$ d) None of these

6) $dv = r^2 \sin\theta \; drd\Phi dz$ is the different volume in _____.
   a) Cylindrical co-ordinate system b) Spherical co-ordinate system
   c) Cartesian co-ordinate system d) None of the above

7) 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 b) True, True
   c) False, True d) False, False

8) Directivity is _____.
   a) Inversely proportional to beamwidth
   b) Inversely proportional to square of beamwidth
   c) directly proportional to beamwidth
   d) directly proportional to square of beamwidth

9) The unit of permeability is _____.
   a) Henry/m
   b) Farad/ m
   c) Henry
   d) Webber

10) The length of mobile antenna is _____.
   a) λ
   b) $\lambda/2$
   c) $\lambda/4$
   d) $> \lambda$

11) For plane waves, the angle between electric and magnetic field is _____.
   a) $90°$
   b) $180°$
   c) $0°$
   d) $720°$

12) Unit of magnetic flux density is _____.
   a) V/m
   b) m/ V
   c) C/m^2
   d) Tesla

13) The wavelength of a 10GHz plane wave is _____.
   a) 300m
   b) 300mm
   c) 3mm
   d) 30mm

14) The ration of the magnitude of electric & magnetic fields is termed as _____.
   a) resistance
   b) Admittance
   c) conductance
   d) Impedance

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019 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 suitable data wherever necessary.

Section – I

Q.2 Solve Any Three. **12**

a) State and prove Gauss Theorem?

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.

c) Given the potential $V = \frac{10}{r^2}\sin\theta\cos\phi$ find D at $(2, \pi/2, 0)$.

d) Let a= 120 cm^2, d= 5 mm and ε_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 **16**

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?

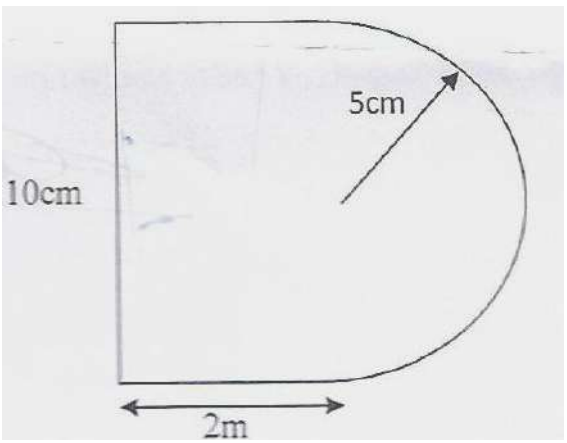
c) State & Prove Divergence theorem?
$D = yxz\ a_x - y^2 a_y + yz\ a_z$. Evaluate Divergence Theorem of both side of unit cube $0 \le x, y, z \le 1$.

Section – II

Q.4 Solve any four **16**

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.



c) Derive Helmholtz wave equations for electromagnetic waves.

d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

$E = 2\ sinx.sint.a_y$

$H = (2/\mu)\cos x\,.\cos t\,.a_z$

e) What is Radiation resistance of antenna? Explain any five properties of antenna.

Q.5 Attempt any two **12**

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.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data if necessary.
3) Figure must be draw wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Directivity is _____.
   a) Inversely proportional to beamwidth
   b) Inversely proportional to square of beamwidth
   c) directly proportional to beamwidth
   d) directly proportional to square of beamwidth

2) The unit of permeability is _____.
   a) Henry/m b) Farad/ m
   c) Henry d) Webber

3) The length of mobile antenna is _____.
   a) λ b) $\lambda/2$
   c) $\lambda/4$ d) $> \lambda$

4) For plane waves, the angle between electric and magnetic field is _____.
   a) $90°$ b) $180°$
   c) $0°$ d) $720°$

5) Unit of magnetic flux density is _____.
   a) V/m b) m/ V
   c) C/m^2 d) Tesla

6) The wavelength of a 10GHz plane wave is _____.
   a) 300m b) 300mm
   c) 3mm d) 30mm

7) The ration of the magnitude of electric & magnetic fields is termed as _____.
   a) resistance b) Admittance
   c) conductance d) Impedance

8) A field line and an equipotential surface are _____.
   a) always parallel b) always at 90^o
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9) Which of the following is true for electrostatics?
   a) $E = -\nabla V$ b) $\nabla^2 \mathrm{V} = 0$
   c) Both (a) and (b) d) None of these

10) Potential energy of a test charge, when moved from a lower potential point to a higher potential point _____.
   a) Remains the same b) Increases
   c) Decreases d) Becomes zero

11) As per Gauss's Law, the total electric flux Ψ through a closed surface and the total charge Q_{en} that surface are related as _____.

a) $\oint D.ds = Q$ b) $\Psi = Q_{en}$

c) Both a & b d) $\oint D.ds = 0$

12) The capacitance of isolated capacitor is _____.

a) $4\pi\varepsilon_0\varepsilon_r a$ b) $\frac{4\pi\varepsilon}{\frac{1}{a}-\frac{1}{b}}$

c) $4\pi\varepsilon_0\varepsilon_r(a-b)$ d) None of these

13) $dv = r^2 \sin\theta \; drd\Phi dz$ is the different volume in _____.

a) Cylindrical co-ordinate system b) Spherical co-ordinate system

c) Cartesian co-ordinate system d) None of the above

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 b) True, True

c) False, True d) False, False

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019 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 suitable data wherever necessary.

Section – I

Q.2 Solve Any Three. **12**

a) State and prove Gauss Theorem?

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.

c) Given the potential $V = \frac{10}{r^2}\sin\theta\cos\phi$ find D at $(2, \pi/2, 0)$.

d) Let a= 120 cm^2, d= 5 mm and ε_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 **16**

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?

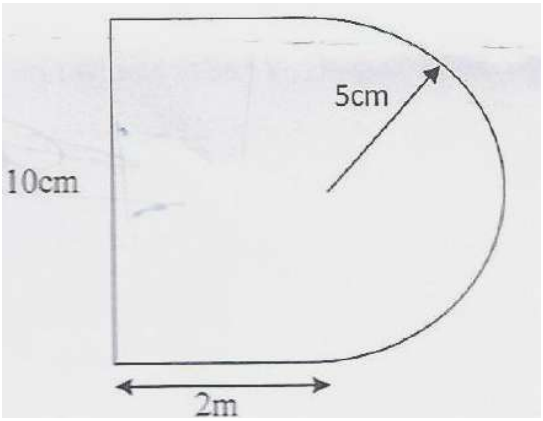
c) State & Prove Divergence theorem?
$D = yxz\ a_x - y^2 a_y + yz\ a_z$. Evaluate Divergence Theorem of both side of unit cube $0 \le x, y, z \le 1$.

Section - II

Q.4 Solve any four **16**

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.



c) Derive Helmholtz wave equations for electromagnetic waves.

d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

$E = 2\ sinx.sint.a_y$

$H = (2/\mu)\cos x\,.\cos t\,.a_z$

e) What is Radiation resistance of antenna? Explain any five properties of antenna.

Q.5 Attempt any two **12**

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.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data if necessary.
3) Figure must be draw wherever necessary.

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 capacitance of isolated capacitor is _____.
   a) $4\pi\varepsilon_0\varepsilon_r a$ b) $\frac{4\pi\varepsilon}{\frac{1}{a}-\frac{1}{b}}$
   c) $4\pi\varepsilon_0\varepsilon_r(a-b)$ d) None of these

2) $dv = r^2 \sin\theta \; drd\Phi dz$ is the different volume in _____.
   a) Cylindrical co-ordinate system b) Spherical co-ordinate system
   c) Cartesian co-ordinate system d) None of the above

3) 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 b) True, True
   c) False, True d) False, False

4) Directivity is _____.
   a) Inversely proportional to beamwidth
   b) Inversely proportional to square of beamwidth
   c) directly proportional to beamwidth
   d) directly proportional to square of beamwidth

5) The unit of permeability is _____.
   a) Henry/m b) Farad/ m
   c) Henry d) Webber

6) The length of mobile antenna is _____.
   a) λ b) $\lambda/2$
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7) For plane waves, the angle between electric and magnetic field is _____.
   a) $90°$ b) $180°$
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8) Unit of magnetic flux density is _____.
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9) The wavelength of a 10GHz plane wave is _____.
   a) 300m
   b) 300mm
   c) 3mm
   d) 30mm

10) The ration of the magnitude of electric & magnetic fields is termed as _____.
   a) resistance
   b) Admittance
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11) A field line and an equipotential surface are _____.
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12) Which of the following is true for electrostatics?
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14) As per Gauss's Law, the total electric flux Ψ through a closed surface and the total charge Q_{en} that surface are related as _____.
   a) $\oint D.ds = Q$
   b) $\Psi = Q_{en}$
   c) Both a & b
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Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019 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.
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Section – I

Q.2 Solve Any Three. **12**

a) State and prove Gauss Theorem?

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.

c) Given the potential $V = \frac{10}{r^2}\sin\theta\cos\phi$ find D at $(2, \pi/2, 0)$.

d) Let a= 120 cm^2, d= 5 mm and ε_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 **16**

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?

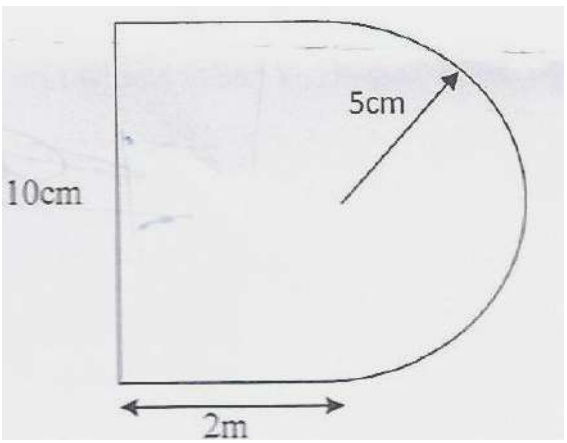
c) State & Prove Divergence theorem?
$D = yxz\ a_x - y^2 a_y + yz\ a_z$. Evaluate Divergence Theorem of both side of unit cube $0 \le x, y, z \le 1$.

Section – II

Q.4 Solve any four **16**

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.



c) Derive Helmholtz wave equations for electromagnetic waves.

d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

$E = 2\ sinx.sint.a_y$

$H = (2/\mu)\cos x\,.\cos t\,.a_z$

e) What is Radiation resistance of antenna? Explain any five properties of antenna.

Q.5 Attempt any two **12**

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.

Seat No.	

Set S

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data if necessary.
3) Figure must be draw wherever necessary.

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 length of mobile antenna is _____.
   a) λ b) $\lambda/2$
   c) $\lambda/4$ d) $> \lambda$

2) For plane waves, the angle between electric and magnetic field is _____.
   a) $90°$ b) $180°$
   c) $0°$ d) $720°$

3) Unit of magnetic flux density is _____.
   a) V/m b) m/ V
   c) C/m^2 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 fields is termed as _____.
   a) resistance b) Admittance
   c) conductance d) Impedance

6) A field line and an equipotential surface are _____.
   a) always parallel b) always at 90^o
   c) inclined at any angle d) none of the above

7) Which of the following is true for electrostatics?
   a) $E = -\nabla V$ b) $\nabla^2 \mathrm{V} = 0$
   c) Both (a) and (b) d) None of these

8) Potential energy of a test charge, when moved from a lower potential point to a higher potential point _____.
   a) Remains the same b) Increases
   c) Decreases d) Becomes zero

9) As per Gauss's Law, the total electric flux Ψ through a closed surface and the total charge Q_{en} that surface are related as _____.
   a) $\oint D.ds = Q$ b) $\Psi = Q_{en}$
   c) Both a & b d) $\oint D.ds = 0$

10) The capacitance of isolated capacitor is _____.

a) $4\pi\varepsilon_0\varepsilon_r a$ b) $\frac{4\pi\varepsilon}{\frac{1}{a}-\frac{1}{b}}$

c) $4\pi\varepsilon_0\varepsilon_r(a-b)$ d) None of these

11) $dv = r^2 \sin\theta \; drd\Phi dz$ is the different volume in _____.

a) Cylindrical co-ordinate system b) Spherical co-ordinate system

c) Cartesian co-ordinate system d) None of the above

12) 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 b) True, True

c) False, True d) False, False

13) Directivity is _____.

a) Inversely proportional to beamwidth
b) Inversely proportional to square of beamwidth
c) directly proportional to beamwidth
d) directly proportional to square of beamwidth

14) The unit of permeability is _____.

a) Henry/m b) Farad/ m

c) Henry d) Webber

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
ELECTRO MAGNETIC ENGINEERING & RADIATING SYSTEM

Day & Date: Friday, 06-11-2019 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 suitable data wherever necessary.

Section – I

Q.2 Solve Any Three. **12**

a) State and prove Gauss Theorem?

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.

c) Given the potential $V = \frac{10}{r^2}\sin\theta\cos\phi$ find D at $(2, \pi/2, 0)$.

d) Let a= 120 cm^2, d= 5 mm and ε_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 **16**

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?

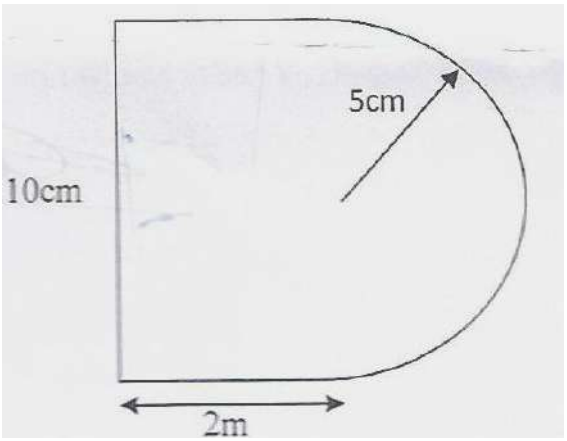
c) State & Prove Divergence theorem?
$D = yxz\ a_x - y^2 a_y + yz\ a_z$. Evaluate Divergence Theorem of both side of unit cube $0 \le x, y, z \le 1$.

Section – II

Q.4 Solve any four **16**

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.



c) Derive Helmholtz wave equations for electromagnetic waves.

d) Verify whether if the wave in free space specified below satisfy Maxwell equations or not.

$E = 2\ sinx.sint.a_y$

$H = (2/\mu)\cos x\,.\cos t\,.a_z$

e) What is Radiation resistance of antenna? Explain any five properties of antenna.

Q.5 Attempt any two **12**

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.

SLR-FM-686

Seat No.		Set	P

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The capacity of communication channel with bandwidth of 5MHz and 15SNR is approximately _____.
   a) 10Mbps b) 20Mbps
   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

5) 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

6) In _____ encoding, we use three levels: positive, zero and negative.
   a) unipolar b) Bipolar
   c) polar d) none of the above

7) The process of correcting channel induced distortion is called _____.
   a) ISI b) matched filter
   c) correlation receiver d) Equalization

8) 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) Four time the bit rate

9) 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

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

Seat No.		Set	P

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 Solve any four of the questions. **16**

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. **12**

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. **16**

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. **12**

a) Write a note on QAM in detail.
b) Explain multichannel digital communication in AWGN channels.
c) Explain the matched filter receiver in detail.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes 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
   c) Twice 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 b) magnitude and frequency
   c) frequency and phase d) none

3) 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

4) 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

5) In Binary FSK, mark and space respectively represent.
   a) 1 and 0 b) 0 and 1
   c) 11 and 00 d) 00 and 11

6) Minimum shift keying is similar to _____.
   a) Continuous phase frequency shift keying
   b) Binary phase shift keying
   c) Binary frequency shift keying
   d) QPSK

7) Advantages of digital communication are _____.
   a) Easy multiplexing b) Easy processing
   c) Reliable d) All of the mentioned

8) The capacity of communication channel with bandwidth of 5MHz and 15SNR is approximately _____.
   a) 10Mbps b) 20Mbps
   c) 75Mbps d) 150Mbps

9) 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

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
   b) Bipolar
   c) polar
   d) none of the above

14) The process of correcting channel induced distortion is called _____.
   a) ISI
   b) matched filter
   c) correlation receiver
   d) Equalization

SLR-FM-686

Seat No.	

Set Q

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 Solve any four of the questions. **16**

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. **12**

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. **16**

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. **12**

a) Write a note on QAM in detail.
b) Explain multichannel digital communication in AWGN channels.
c) Explain the matched filter receiver in detail.

Seat No.		Set	R

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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

2) In _____ encoding, we use three levels: positive, zero and negative.
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   c) polar d) none of the above

3) The process of correcting channel induced distortion is called _____.
   a) ISI b) matched filter
   c) correlation receiver d) Equalization

4) 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) 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

6) The correlation receiver consist of _____.
   a) a multiplier and integrator
   b) an adder and an integrator
   c) a multiplier and a differentiation
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7) 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

8) In Binary FSK, mark and space respectively represent.
   a) 1 and 0 b) 0 and 1
   c) 11 and 00 d) 00 and 11

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

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 _____.
   a) 10Mbps
   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 respectively. The entropy of the system is _____.
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   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
   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

SLR-FM-686

Seat No.	

Set R

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 Solve any four of the questions. **16**

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. **12**

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. **16**

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. **12**

a) Write a note on QAM in detail.
b) Explain multichannel digital communication in AWGN channels.
c) Explain the matched filter receiver in detail.

Seat No.		Set	S

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) 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

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   a) Easy multiplexing b) Easy processing
   c) Reliable d) All of the mentioned

6) The capacity of communication channel with bandwidth of 5MHz and 15SNR is approximately _____.
   a) 10Mbps b) 20Mbps
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7) 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 _____.
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8) The bandwidth requirement of Pulse Width Modulation is higher than that of Pulse amplitude modulation _____.
   a) True b) False

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   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) Four time the bit rate

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

SLR-FM-686

Seat No.	

Set S

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
PRINCIPLES OF DIGITAL COMMUNICATION

Day & Date: Monday, 09-12-2019 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 Solve any four of the questions. **16**

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. **12**

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. **16**

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. **12**

a) Write a note on QAM in detail.
b) Explain multichannel digital communication in AWGN channels.
c) Explain the matched filter receiver in detail.

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates 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) Cascade Arrangement is Present in _____.
   a) Evolutionary Development b) Incremental Delivery
   c) Waterfall Model d) None

2) Functional Requirements considers _____.
   a) Output b) Input
   c) Security d) Input & output

3) System testing involves _____.
   a) Integration testing b) Release testing
   c) Interface testing d) Both a and b

4) Behavioral Model is called as _____.
   a) Object Model b) Dataflow model
   c) Context Model d) V Model

5) 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

6) Dataflow Model & state machine model are types of _____.
   a) Context Model b) Behavioral Model
   c) Data Model d) All

7) Partition testing is part of _____.
   a) Release testing b) Component testing
   c) System testing d) Performance testing

8) Test automation helps to _____.
   a) Reduce the cost of testing b) Increase the cost of testing
   c) Reduce time of testing d) Increase time of testing

9) CBSE Approach is based on _____.
   a) Existence of reusable components
   b) Existence of new components
   c) Nonexistence of components
   d) None of above

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
   c) the project management plan
   d) sub-contractor's responsibilities

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) Task
   c) Structure and technology
   d) All

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
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 three. **12**

a) Explain Software Life Cycle concept.
b) Explain Test Automation.
c) Explain in detail System Testing.
d) Compare: V Model with Prototyping Model.
e) List & Explain char. of Software Process.

Q.3 Solve any two. **16**

a) Write note on RUP with Diagram & Phases.
b) List types of non-functional requirement. Explain general structure of requirement.
c) List System Models & explain any one of them.
d) Compare Functional Requirement with Nonfunctional Requirement.

Section – II

Q.4 Solve any three. **12**

a) Discuss PERT.
b) Explain Model of Risk Framework.
c) List Steps for Resource Planning.
d) Explain the management process with its need.

Q.5 Solve any two. **16**

a) Explain project evaluation with its significance.
b) Explain risk identification? Which are two methods used for risk identification.
c) Draw an activity network using either activity on node or activity on arrow network convention for Project "Choosing & Purchasing a Laptop".

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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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) Test automation helps to _____.
   a) Reduce the cost of testing b) Increase the cost of testing
   c) Reduce time of testing d) Increase time of testing

2) CBSE Approach is based on _____.
   a) Existence of reusable components
   b) Existence of new components
   c) Nonexistence of components
   d) None of above

3) Software Specification is process of _____.
   a) Understanding & defining service required
   b) Identifying the constraints on system
   c) Both a & b
   d) Identifying document

4) Scheduling can best be defined as the process used to determine _____.
   a) overall project duration b) project cost estimating
   c) the project management plan d) sub-contractor's responsibilities

5) Risk is _____.
   a) Event which may arrive in future
   b) Negative effect causing events
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6) The basic resource of the organization is _____.
   a) Money b) Machines
   c) Manpower d) All of them

7) Framework of risk contains the categories as _____.
   a) Actors b) Task
   c) Structure and technology d) All

8) Cascade Arrangement is Present in _____.
   a) Evolutionary Development b) Incremental Delivery
   c) Waterfall Model d) None

9) Functional Requirements considers _____.
   a) Output b) Input
   c) Security d) Input & output

10) System testing involves _____.
   a) Integration testing b) Release testing
   c) Interface testing d) Both a and b

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.
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13) Dataflow Model & state machine model are types of _____.
   a) Context Model b) Behavioral Model
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14) Partition testing is part of _____.
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Seat No.	

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Seat No.	

Set **R**

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SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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MCQ/Objective Type Questions

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Seat No.	

Set **R**

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SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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Seat No.	

Set **S**

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Electronics & Telecommunication Engineering
SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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MCQ/Objective Type Questions

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Seat No.	

Set **S**

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SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

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b) List types of non-functional requirement. Explain general structure of requirement.
c) List System Models & explain any one of them.
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Section – II

Q.4 Solve any three. **12**

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Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Max. Marks: 70
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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) 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

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) N b) N(N-1)
   c) N^2 d) N^3

4) The magnitude response for DFT exhibits complex conjugate property if time sequence is _____.
   a) a real sequence b) a complex sequence
   c) an imaginary sequence d) not a real sequence

5) Decimation in time FFT decimates _____.
   a) DFT coefficients b) Input sequence
   c) Both sequence and DFT d) None

6) Circular convolution can be performed using the methods _____.
   a) Concentric Circle b) Matrix Multiplication
   c) Both a & b d) None of above

7) In DIT, the data x(n) is stored in _____ order.
   a) Reversed order b) Bit reversal
   c) Non-shuffled d) None

8) 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

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
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   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
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Set **P**

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
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Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt any three. **12**

a) Determine the cross correlation sequence of sequences.
X(n) = {1, 2, 3, 4, 5} , y(n) = {5, 6, 7, 8, 9}
(↑ under 1; ↑ under 5)

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**

a) Determine the output of a linear FIR filter whose impulse response 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.
$$y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$$

c) Explain the finite word length effect in FIR Filter.

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. **16**

a) Design a ideal high pass filter with a frequency response using hanning window.
$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \le |\omega| \le \pi$
$= 0$ 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 0.25π 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 No.	

Set **Q**

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Duration: 30 Minutes Marks: 14

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2) Unwrapped phase response of FIR filter in pass band is _____.
   a) Exponentially increasing b) Exponentially decreasing
   c) Non- linear d) linear

3) 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
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4) The binary signed number 0.11010111 when rounded to seven bits will result in number given by _____.
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Seat No.	

Set **R**

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13) Multiplication are required to compute N point DFT _____.
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   c) N^2
   d) N^3

14) The magnitude response for DFT exhibits complex conjugate property if time sequence is _____.
   a) a real sequence
   b) a complex sequence
   c) an imaginary sequence
   d) not a real sequence

Seat No.	

Set **R**

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**

a) Determine the cross correlation sequence of sequences.
X(n) = {1, 2, 3, 4, 5} , y(n) = {5, 6, 7, 8, 9}
(↑ under 1; ↑ under 5)

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**

a) Determine the output of a linear FIR filter whose impulse response 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.
$$y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$$

c) Explain the finite word length effect in FIR Filter.

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. **16**

a) Design a ideal high pass filter with a frequency response using hanning window.
$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \le |\omega| \le \pi$
$= 0$ 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 0.25π 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 No.		Set	S

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
DIGITAL SIGNAL PROCESSING

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No.1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes 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
   b) Different frequency response and is unstable
   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}

8) Multiplication are required to compute N point DFT _____.
   a) N b) N(N-1)
   c) N^2 d) N^3

9) The magnitude response for DFT exhibits complex conjugate property if time sequence is _____.
   a) a real sequence b) a complex sequence
   c) an imaginary sequence d) not a real sequence

10) Decimation in time FFT decimates _____.
   a) DFT coefficients b) Input sequence
   c) Both sequence and DFT 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

13) 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

14) Unwrapped phase response of FIR filter in pass band is _____.
   a) Exponentially increasing b) Exponentially decreasing
   c) Non- linear d) linear

Seat No.	

Set **S**

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**

a) Determine the cross correlation sequence of sequences.
X(n) = {1, 2, 3, 4, 5} , y(n) = {5, 6, 7, 8, 9}
(↑ under 1; ↑ under 5)

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**

a) Determine the output of a linear FIR filter whose impulse response 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.
$$y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$$

c) Explain the finite word length effect in FIR Filter.

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. **16**

a) Design a ideal high pass filter with a frequency response using hanning window.
$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \le |\omega| \le \pi$
$= 0$ 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 0.25π 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 No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates 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. **14**

1) The contents of accumulator before CMA instruction are A5 H. Its contents after instruction execution is _____.
   a) A5H b) 5AH
   c) AAH d) 55H

2) The contents of accumulator after execution of following Instructions will be,
   MVI A, B7 H
   ORA A
   RAL
   a) 4FH b) 5EH
   c) 5FH d) EFH

3) The width of address bus and data bus of 8085 are respectively _____.
   a) 16,8 b) 8,16
   c) 8,8 d) 16,16

4) In response to RST 7.5 interrupt, the execution of control transfers to memory location _____.
   a) 0000H b) 002CH
   c) 0034H d) 003CH

5) The status of S0 and S1 pins for memory write is _____.
   a) 0,0 b) 0,1
   c) 1,0 d) 1,1

6) 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

7) 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

8) 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
   b) STA, add , LDA add
   c) LDA add, LDA add
   d) LDA add, STA add

9) 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
   c) 11 H
   d) None of the above

10) How many flags are there in 8086?
   a) 9
   b) 8
   c) 10
   d) 7

11) Direction of Gate signal for 8253 IC is _____.
   a) Input
   b) Output
   c) Bidirectional
   d) None

12) Key debouncing can be obtained thro _____.
   a) Only software
   b) Only hardware
   c) Both hardware & software
   d) None

13) In control word format, if RL=1 and RL0=0 then the operation performed is _____.
   a) read /Load Least significant byte only
   b) read /Load most significant byte only
   c) read /Load LSB First and then MSB
   d) read /Load MSB First and then LSB

14) 8251 supports the baud rate for asynchronous communication is _____.
   a) DC to 19.2 K band
   b) DC to 64 K band
   c) DC to 128 K band
   d) Any baud rate

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **12**

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. **16**

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.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates 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. **14**

1) 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 b) STA, add , LDA add
   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 _____.
   a) 10 H b) 12 H
   c) 11 H d) None of the above

3) How many flags are there in 8086?
   a) 9 b) 8
   c) 10 d) 7

4) Direction of Gate signal for 8253 IC is _____.
   a) Input b) Output
   c) Bidirectional d) None

5) Key debouncing can be obtained thro _____.
   a) Only software b) Only hardware
   c) Both hardware & software d) None

6) In control word format, if RL=1 and RL0=0 then the operation performed is _____.
   a) read /Load Least significant byte only
   b) read /Load most significant byte only
   c) read /Load LSB First and then MSB
   d) read /Load MSB First and then LSB

7) 8251 supports the baud rate for asynchronous communication is _____.
   a) DC to 19.2 K band b) DC to 64 K band
   c) DC to 128 K band 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

9) The contents of accumulator after execution of following Instructions will be,
MVI A, B7 H
ORA A
RAL
a) 4FH b) 5EH
c) 5FH d) EFH

10) The width of address bus and data bus of 8085 are respectively _____.
a) 16,8 b) 8,16
c) 8,8 d) 16,16

11) In response to RST 7.5 interrupt, the execution of control transfers to memory location _____.
a) 0000H b) 002CH
c) 0034H d) 003CH

12) The status of S0 and S1 pins for memory write is _____.
a) 0,0 b) 0,1
c) 1,0 d) 1,1

13) 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

14) 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

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **12**

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. **16**

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.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates 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. **14**

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

3) 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 b) STA, add , LDA add
   c) LDA add, LDA add d) 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
   c) 11 H d) None of the above

6) 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) Only hardware
   c) Both hardware & software d) None

9) In control word format, if RL=1 and RL0=0 then the operation performed is _____.
   a) read /Load Least significant byte only
   b) read /Load most significant byte only
   c) read /Load LSB First and then MSB
   d) read /Load MSB First and then LSB

10) 8251 supports the baud rate for asynchronous communication is _____.
   a) DC to 19.2 K band
   b) DC to 64 K band
   c) DC to 128 K band
   d) Any baud rate

11) The contents of accumulator before CMA instruction are A5 H. Its contents after instruction execution is _____.
   a) A5H
   b) 5AH
   c) AAH
   d) 55H

12) The contents of accumulator after execution of following Instructions will be,
   MVI A, B7 H
   ORA A
   RAL
   a) 4FH
   b) 5EH
   c) 5FH
   d) EFH

13) The width of address bus and data bus of 8085 are respectively _____.
   a) 16,8
   b) 8,16
   c) 8,8
   d) 16,16

14) In response to RST 7.5 interrupt, the execution of control transfers to memory location _____.
   a) 0000H
   b) 002CH
   c) 0034H
   d) 003CH

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **12**

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. **16**

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.

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates 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. **14**

1) How many flags are there in 8086?
   a) 9 b) 8
   c) 10 d) 7

2) Direction of Gate signal for 8253 IC is _____.
   a) Input b) Output
   c) Bidirectional d) None

3) Key debouncing can be obtained thro _____.
   a) Only software b) Only hardware
   c) Both hardware & software d) None

4) In control word format, if RL=1 and RL0=0 then the operation performed is _____.
   a) read /Load Least significant byte only
   b) read /Load most significant byte only
   c) read /Load LSB First and then MSB
   d) read /Load MSB First and then LSB

5) 8251 supports the baud rate for asynchronous communication is _____.
   a) DC to 19.2 K band b) DC to 64 K band
   c) DC to 128 K band d) Any baud rate

6) The contents of accumulator before CMA instruction are A5 H. Its contents after instruction execution is _____.
   a) A5H b) 5AH
   c) AAH d) 55H

7) The contents of accumulator after execution of following Instructions will be,
   MVI A, B7 H
   ORA A
   RAL
   a) 4FH b) 5EH
   c) 5FH d) EFH

8) The width of address bus and data bus of 8085 are respectively _____.
   a) 16,8 b) 8,16
   c) 8,8 d) 16,16

9) In response to RST 7.5 interrupt, the execution of control transfers to memory location _____.
   a) 0000H b) 002CH
   c) 0034H d) 003CH

10) The status of S0 and S1 pins for memory write is _____.
   a) 0,0 b) 0,1
   c) 1,0 d) 1,1

11) 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

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 b) 512
   c) 256 d) 65536

13) 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 b) STA, add , LDA add
   c) LDA add, LDA add d) LDA add, STA add

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
   c) 11 H d) None of the above

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
MICROPROCESSORS

Day & Date: Monday, 16-12-2019 Max. Marks: 56
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. **16**

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. **12**

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. **12**

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. **16**

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.

SLR-FM-769

Seat No.	

Set P

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 100
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 sentence. **20**

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)

3) 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

7) If addition of α 1 and α 2 reaches unity then anode current will reach (w.r.t. two transistor analogy of SCR) _____.
   a) zero b) infinity
   c) negative d) none

8) 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

9) Single phase full converter with highly inductive load is _____ quadrant converter.
   a) Single b) Two
   c) Four d) Both a) and b)

10) 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

11) Which chopper circuit uses saturable reactor?
   a) Auxiliary commutated b) Jones Chopper
   c) Morgan Chopper d) Load commutated

12) A cyclo converter can be.
   a) Step up b) Step down
   c) Step up or step down d) None

13) In a 3 phase fully controlled converter the firing frequency is _____.
   a) 3 times the line frequency b) 6 times the line frequency
   c) 9 times the line frequency d) 12 times the line frequency

14) The cycloconverter is used in _____.
   a) AC drive b) DC drive
   c) Both d) None

15) Back up time for off line UPS depends on _____.
   a) Load b) Battery
   c) Both d) None

16) Chopper Converter is _____.
   a) AC to DC b) DC to AC
   c) DC to DC d) AC to AC

17) If T_{ON} is kept constant and T_{OFF} is varied then chopper control technique is _____.
   a) Variable frequency b) Fixed frequency
   c) Current limit control d) Both a) and b)

18) 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

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) 120° each cycle
   c) 180° each cycle d) 360°each cycle

20) In a single phase half-wave thyristor circuit with R load & $Vs=Vm \sin\omega t$, the maximum value of the load current can be given by _____.
   a) 2Vm/R b) Vs/R
   c) Vm/2 d) Vs/2

SLR-FM-769

Seat No.	

Set P

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 80
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. **16**

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. **24**

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 & Vl characteristics of TRIAC.

d) Explain construction, working & Vl characteristics of SCR.

Section - II

Q.4 Attempt any four. **16**

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. **24**

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.

SLR-FM-769

Seat No.	

Set Q

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 100
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 sentence. **20**

1) Which of the following PNPN devices are bidirectional?
   a) TRIAC b) DIAC
   c) Thyristor d) Both a and b

2) If addition of α 1 and α 2 reaches unity then anode current will reach (w.r.t. two transistor analogy of SCR) _____.
   a) zero b) infinity
   c) negative d) none

3) 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

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 = 0
   c) a > 90 d) None

6) Which chopper circuit uses saturable reactor?
   a) Auxiliary commutated b) Jones Chopper
   c) Morgan Chopper d) Load commutated

7) A cyclo converter can be.
   a) Step up b) Step down
   c) Step up or step down d) None

8) In a 3 phase fully controlled converter the firing frequency is _____.
   a) 3 times the line frequency b) 6 times the line frequency
   c) 9 times the line frequency d) 12 times the line frequency

9) The cycloconverter is used in _____.
   a) AC drive b) DC drive
   c) Both d) None

10) Back up time for off line UPS depends on _____.
   a) Load b) Battery
   c) Both d) None

11) Chopper Converter is _____.
   a) AC to DC b) DC to AC
   c) DC to DC d) AC to AC

12) If T_{ON} is kept constant and T_{OFF} is varied then chopper control technique is _____.
   a) Variable frequency b) Fixed frequency
   c) Current limit control d) Both a) and b)

13) 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

14) 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) 120° each cycle
   c) 180° each cycle d) 360°each cycle

15) In a single phase half-wave thyristor circuit with R load & $Vs=Vm \sin\omega t$, the maximum value of the load current can be given by _____.
   a) 2Vm/R b) Vs/R
   c) Vm/2 d) Vs/2

16) TRIAC can be termed as _____.
   a) AC switch b) DC switch
   c) Both a) and b) d) Square wave switch

17) Thyristor is a semiconductor switch which is _____.
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18) 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
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   c) Circuit time constant is greater than device turn off time
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19) In SCR angle of conduction can be varied by changing _____.
   a) Anode voltage
   b) Anode current
   c) Forward current rating
   d) Gatecurrent

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   a) AC, DC
   b) DC, AC
   c) AC, AC
   d) DC, DC

SLR-FM-769

Seat No.	

Set Q

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 80
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. **16**

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. **24**

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 & Vl characteristics of TRIAC.

d) Explain construction, working & Vl characteristics of SCR.

Section - II

Q.4 Attempt any four. **16**

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. **24**

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.

SLR-FM-769

Seat No.	

Set R

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 100
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 sentence. **20**

1) Which chopper circuit uses saturable reactor?
   a) Auxiliary commutated b) Jones Chopper
   c) Morgan Chopper d) Load commutated

2) A cyclo converter can be.
   a) Step up b) Step down
   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 b) 6 times the line frequency
   c) 9 times the line frequency d) 12 times the line frequency

4) The cycloconverter is used in _____.
   a) AC drive b) DC drive
   c) Both d) None

5) Back up time for off line UPS depends on _____.
   a) Load b) Battery
   c) Both d) None

6) Chopper Converter is _____.
   a) AC to DC b) DC to AC
   c) DC to DC d) AC to AC

7) If T_{ON} is kept constant and T_{OFF} is varied then chopper control technique is _____.
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8) For a step-up chopper, when the duty cycle is increased the average value of the output voltage _____.
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   c) remains the same d) none

9) 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) 120° each cycle
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10) In a single phase half-wave thyristor circuit with R load & $Vs=Vm \sin\omega t$, the maximum value of the load current can be given by _____.
   a) 2Vm/R b) Vs/R
   c) Vm/2 d) Vs/2

11) TRIAC can be termed as _____.
   a) AC switch b) DC switch
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12) Thyristor is a semiconductor switch which is _____.
   a) Unidirectional b) Bidirectional
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   a) Circuit turn off time is less than device turn off time
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14) In SCR angle of conduction can be varied by changing _____.
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15) Thyristor can be termed as _____ switch and TRIAC can be termed as _____ switch.
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a) Single
b) Two
c) Four
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20) In single phase full Converter with highly inductive load output is in Inverting mode when _____. [Alpha=a]

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b) a = 0
c) a > 90
d) None

SLR-FM-769

Seat No.	

Set R

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 80
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. **16**

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. **24**

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 & Vl characteristics of TRIAC.

d) Explain construction, working & Vl characteristics of SCR.

Section - II

Q.4 Attempt any four. **16**

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. **24**

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.

SLR-FM-769

Seat No.		Set	S

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 100
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 sentence. **20**

1) Chopper Converter is _____.
   a) AC to DC b) DC to AC
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   a) Variable frequency b) Fixed frequency
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3) For a step-up chopper, when the duty cycle is increased the average value of the output voltage _____.
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4) 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 _____.
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   a) 2Vm/R b) Vs/R
   c) Vm/2 d) Vs/2

6) TRIAC can be termed as _____.
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9) In SCR angle of conduction can be varied by changing _____.
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18) In a 3 phase fully controlled converter the firing frequency is _____.
   a) 3 times the line frequency b) 6 times the line frequency
   c) 9 times the line frequency d) 12 times the line frequency

19) The cycloconverter is used in _____.
   a) AC drive b) DC drive
   c) Both d) None

20) Back up time for off line UPS depends on _____.
   a) Load b) Battery
   c) Both d) None

SLR-FM-769

Seat No.	

Set | **S**

T.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
INDUSTRIAL ELECTRONICS

Day & Date: Friday, 29-11-2019 Max. Marks: 80
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. **16**

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. **24**

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 & Vl characteristics of TRIAC.

d) Explain construction, working & Vl characteristics of SCR.

Section - II

Q.4 Attempt any four. **16**

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.

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Q.5 Attempt any three. **24**

a) Explain working of series resonant inverter. Draw input and output waveform.

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c) Draw & explain Jones and Morgan chopper.

d) Draw & explain single phase parallel inverter with inductive load.

SLR-FM-770

Seat No.	

Set P

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 100
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 Marks: 20

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

1) Implication connective is equivalent to Fuzzy relation R as
   a) $(A \times B) \cup (\bar{A} \times Y)$ b) $(A \times B) \cup (A \times Y)$
   c) $(A \times B) \cap (\bar{A} \times Y)$ d) None

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
   c) Null set
   d) None

3) Fuzzy system are _____.
   a) Control system b) Rule based system
   c) Both (a) and (b) d) None

4) $A\ U\ A' = X$ is called as _____.
   a) Axiom of excluded middle b) Axiom of Contradiction
   c) Union operation d) None

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

6) The induction is performed by _____.
   a) Standard value b) Mean value calculations
   c) Entropy minimizations d) None

7) Centroid method is also known as _____.
   a) Centre of area
   b) Centre of gravity
   c) Both (a) and (b)
   d) None

8) 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

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 as _____.
   a) $B \rightarrow A$
   b) $A \rightarrow B$
   c) $A \rightarrow \bar{B}$
   d) None

11) Cognitive maps graphically describes a system in terms of _____.
   a) Concept variables
   b) Concept variables and causal relations
   c) Causal relations
   d) None

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 relation between _____.
   a) Disease & patient
   b) Symptoms & patient
   c) Both a and b
   d) None

14) Chromosomes x & y, to which crossover operation is applied is called _____.
   a) Mutation
   b) Mates
   c) Fitness
   d) None

15) For Nontransitive ranking, we introduce a special notion of _____.
   a) Transitive
   b) Relativity
   c) Ordinal ranking
   d) 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) Static
   b) Constant
   c) Random
   d) None

18) 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

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 d) None

Seat No.	

Set **P**

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 80
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. **20**

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) $[4, 2] \times [1, 2]$

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

Q.3 Answer the Following. **20**

a) A fuzzy tolerance relation, $\underset{\sim}{R}$, is reflexive and symmetric. Find the equivalence relation $\underset{\sim}{R}_e$ and then classify it according to λ-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

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}\right]\left[\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}\right]$$

With initial state $C^1 = [1 \;\; 0.7 \;\; 0.6 \;\; 0.4]$

Inputs $A1 = [0.4 \;\; 0]$ $A2 = [1 \;\; 0]$ $A3 = [1 \;\; 0.7]$

OR

b) What is defuzzification? Explain methods of defuzzification?

Section – II

Q.4 Answer the following. **20**

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.

OR

a) Explain following
1) Fuzzy linear programming
2) Nontransitive ranking

b) Explain FSPC for measurement and attribute SPC.

Q.5 Attempt any four. **20**

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.

SLR-FM-770

Seat No.	

Set Q

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 100
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 Marks: 20

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

1) 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

4) 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

5) Fuzzy relation R based on, IF A, THEN B as _____.
   a) $B \rightarrow A$ b) $A \rightarrow B$
   c) $A \rightarrow \bar{B}$ 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

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 relation between _____.
   a) Disease & patient b) Symptoms & patient
   c) Both a and b d) None

9) Chromosomes x & y, to which crossover operation is applied is called _____.
   a) Mutation b) Mates
   c) Fitness d) None

10) For Nontransitive ranking, we introduce a special notion of _____.
   a) Transitive b) Relativity
   c) Ordinal ranking d) None

11) Interval valued fuzzy sets can further be generalized as _____.
   a) Type II fuzzy sets b) Ordinary fuzzy sets
   c) Fuzzy power sets d) None

12) Rank ordering ambiguity demonstrated for both fuzzy and _____ variables.
   a) Static b) Constant
   c) Random d) 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 are_____.
   a) Occurrence relation b) Confirmability relation
   c) Both (a) and (b) d) All

15) Fuzzy regression analysis uses _____ to represent the coefficient.
   a) Fuzzy number b) Fuzzy coefficient
   c) Fuzzy function d) None

16) Implication connective is equivalent to Fuzzy relation R as
   a) $(A \times B) \cup (\bar{A} \times Y)$ 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
   b) Rule based system
   c) Both (a) and (b)
   d) None

19) $A\ U\ A' = X$ is called as _____.
   a) Axiom of excluded middle
   b) Axiom of Contradiction
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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 _____.
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   d) None

Seat No.	

Set **Q**

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 80
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. **20**

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) $[4, 2] \times [1, 2]$

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

Q.3 Answer the Following. **20**

a) A fuzzy tolerance relation, $\underset{\sim}{R}$, is reflexive and symmetric. Find the equivalence relation $\underset{\sim}{R}_e$ and then classify it according to λ-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

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}\right]\left[\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}\right]$$

With initial state $C^1 = [1 \;\; 0.7 \;\; 0.6 \;\; 0.4]$

Inputs $A1 = [0.4 \;\; 0]$ $A2 = [1 \;\; 0]$ $A3 = [1 \;\; 0.7]$

OR

b) What is defuzzification? Explain methods of defuzzification?

Section – II

Q.4 Answer the following. **20**

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.

OR

a) Explain following
   1) Fuzzy linear programming
   2) Nontransitive ranking

b) Explain FSPC for measurement and attribute SPC.

Q.5 Attempt any four. **20**

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.	

Set | R

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 100
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 Marks: 20

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

1) Cognitive maps graphically describes a system in terms of _____.
   a) Concept variables
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   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 b) IF-THEN rules
   c) linguistic labels d) None

3) The physician's medical knowledge is represented as a fuzzy relation between _____.
   a) Disease & patient b) Symptoms & patient
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4) Chromosomes x & y, to which crossover operation is applied is called _____.
   a) Mutation b) Mates
   c) Fitness d) None

5) For Nontransitive ranking, we introduce a special notion of _____.
   a) Transitive b) Relativity
   c) Ordinal ranking d) None

6) Interval valued fuzzy sets can further be generalized as _____.
   a) Type II fuzzy sets b) Ordinary fuzzy sets
   c) Fuzzy power sets d) None

7) Rank ordering ambiguity demonstrated for both fuzzy and _____ variables.
   a) Static b) Constant
   c) Random d) None

8) 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

9) The model proposes two types of relation exist between symptoms and disease are_____.
   a) Occurrence relation b) Confirmability relation
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10) Fuzzy regression analysis uses _____ to represent the coefficient.
   a) Fuzzy number b) Fuzzy coefficient
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11) Implication connective is equivalent to Fuzzy relation R as
   a) $(A \times B) \cup (\bar{A} \times Y)$ b) $(A \times B) \cup (A \times Y)$
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12) A/B is defined as _____.
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18) The optimum partition, U*, to be the partition that produces _____.
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19) Family of Fuzzy partition matrices, M_{FC}, for the classification involving C classes and n data points _____.
   a) $\{(U|\mu ik \in [0,1]; \sum_{i=1}^{C} \mu ik = 1; 0 < \sum_{k=1}^{C} < n;\}$
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   b) $A \rightarrow B$
   c) $A \rightarrow \bar{B}$
   d) None

Seat No.	

Set **R**

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 80
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. **20**

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) $[4, 2] \times [1, 2]$

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

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Q.3 Answer the Following. **20**

a) A fuzzy tolerance relation, $\underset{\sim}{R}$, is reflexive and symmetric. Find the equivalence relation $\underset{\sim}{R}_e$ and then classify it according to λ-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

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}\right]\left[\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}\right]$$

With initial state $C^1 = [1 \;\; 0.7 \;\; 0.6 \;\; 0.4]$

Inputs $A1 = [0.4 \;\; 0]$ $A2 = [1 \;\; 0]$ $A3 = [1 \;\; 0.7]$

OR

b) What is defuzzification? Explain methods of defuzzification?

Section – II

Q.4 Answer the following. **20**

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.

OR

a) Explain following
1) Fuzzy linear programming
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Seat No.	

Set | S

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 100
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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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 20

1) Interval valued fuzzy sets can further be generalized as _____.
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   c) Fuzzy power sets d) None

2) Rank ordering ambiguity demonstrated for both fuzzy and _____ variables.
   a) Static b) Constant
   c) Random d) None

3) In fuzzy expert systems, the knowledge is usually represented by the set of _____.
   a) Fuzzy production rules b) Fuzzy nos
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4) The model proposes two types of relation exist between symptoms and disease are_____.
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6) Implication connective is equivalent to Fuzzy relation R as
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7) A/B is defined as _____.
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8) Fuzzy system are _____.
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Seat No.	

Set | S

B.E. (Part – II) (Old) Examination Nov/Dec-2019
Electronics & Telecommunication Engineering
FUZZY LOGIC

Day & Date: Wednesday, 27-11-2019 Max. Marks: 80
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
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Section – I

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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

Q.3 Answer the Following. **20**

a) A fuzzy tolerance relation, $\underset{\sim}{R}$, is reflexive and symmetric. Find the equivalence relation $\underset{\sim}{R}_e$ and then classify it according to λ-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

$$S = \left[\begin{bmatrix} 0 & 0.3 & 0.9 & 1 \\ 0.5 & 1 & 0 & 0.2 \\ 0.6 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}\right]\left[\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0.2 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0.4 & 0 & 0.6 \end{bmatrix}\right]$$

With initial state $C^1 = [1 \;\; 0.7 \;\; 0.6 \;\; 0.4]$

Inputs $A1 = [0.4 \;\; 0]$ $\quad A2 = [1 \;\; 0]$ $\quad A3 = [1 \;\; 0.7]$

OR

b) What is defuzzification? Explain methods of defuzzification?

Section – II

Q.4 Answer the following. **20**

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.

OR

a) Explain following
1) Fuzzy linear programming
2) Nontransitive ranking

b) Explain FSPC for measurement and attribute SPC.

Q.5 Attempt any four. **20**

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.