

Seat No.	
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ENGINEERING MATHEMATICS – III**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory should be solved in first 30 minutes in answer book.  
 2) Use of non programmable calculator is allowed.  
 3) 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) For  $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$ , The particular integral is \_\_\_\_\_.
  - a)  $c_1e^{-x} + c_2e^{-3x}$
  - b)  $\frac{1}{15}e^{2x}$
  - c)  $\frac{1}{5}e^{2x}$
  - d)  $3e^{2x}$
  
- 2)  $\frac{1}{D+m}X = \text{_____}$ .
  - a)  $e^{-mx} \int X e^{mx} dx$
  - b)  $e^{mx} \int X e^{-mx} dx$
  - c)  $e^{-mx} \int X dx$
  - d)  $e^{mx} \int X dx$
  
- 3)  $L\{e^{-t} \sinh t\} = \text{_____}$ .
  - a)  $\frac{1}{s(s-2)}$
  - b)  $\frac{1}{s^2+2s+2}$
  - c)  $\frac{1}{s^2-2s+2}$
  - d)  $\frac{1}{s(s+2)}$
  
- 4) Which of the following is true?
  - a)  $L^{-1}\{\phi'(s)\} = tL^{-1}\{\phi(s)\}$
  - b)  $L^{-1}\{\phi'(s)\} = -tL^{-1}\{\phi(s)\}$
  - c)  $L^{-1}\{\phi'(s)\} = \frac{-1}{t}L^{-1}\{\phi(s)\}$
  - d)  $L^{-1}\{\phi'(s)\} = \frac{1}{t}L^{-1}\{\phi(s)\}$
  
- 5)  $L^{-1}\left\{\frac{1}{\sqrt{s}}\right\} = \text{_____}$ .
  - a)  $\sqrt{\frac{\pi}{t}}$
  - b)  $\frac{1}{\sqrt{\pi t}}$
  - c)  $\sqrt{\frac{t}{\pi}}$
  - d)  $\frac{t}{\sqrt{\pi}}$
  
- 6) If  $U(K) = \begin{cases} 1, & K \geq 0 \\ 0, & K < 0 \end{cases}$  then  $Z\{U(K)\} = \text{_____}$ .
  - a)  $\frac{1}{z-1}$
  - b)  $\frac{1}{1-z}$
  - c)  $\frac{z}{z-1}$
  - d)  $\frac{z}{1-z}$

- 7) If  $z\{f(k)\} = F(z)$ , then  $z\{a^k f(k)\} = \underline{\hspace{2cm}}$ .
- a)  $F\left(\frac{z}{a}\right)$     b)  $\frac{1}{a}F\left(\frac{z}{a}\right)$   
c)  $F\left(\frac{a}{z}\right)$     d)  $\frac{1}{z}F\left(\frac{a}{z}\right)$
- 8) In half range cosine series for  $f(x) = (x - 1)^2, 0 \leq x \leq 1$  the constant term is  $\underline{\hspace{2cm}}$ .
- a)  $1/3$     b)  $-1/3$   
c) 0    d) 1
- 9) The equations of lines of regression are  $x + 2y = 5$  and  $2x + 3y = 8$  then mean  $\bar{x}$  and  $\bar{y}$  are  $\underline{\hspace{2cm}}$ .
- a) 1 and 3    b) 2 and 3  
c) 2 and 5    d) 1 and 2
- 10) A continuous random variable has the following density function  $f(x) = kx, 0 \leq x \leq 2$ , Then  $k = \underline{\hspace{2cm}}$ .
- a)  $1/2$     b)  $1/4$   
c)  $3/2$     d)  $3/4$
- 11) The conditions of expansions of function in Fourier series are known as  $\underline{\hspace{2cm}}$ .
- a) Harmonic    b) Cauchy  
c) Riemann's conditions    d) Dirichlet's conditions
- 12) The value of coefficient of correlation  $r$  lies between  $\underline{\hspace{2cm}}$ .
- a) -2 and 1    b) -1 and 1  
c) 1 and 2    d) 2 and 3
- 13) Which of the following method is used to determine numerically largest eigen value and corresponding eigen vector of given matrix?
- a) Gauss Seidal method    b) Gauss Elimination  
c) Power method    d) Newton's method
- 14) The Newton Raphson method fails when  $\underline{\hspace{2cm}}$ .
- a)  $f'(x)$  is negative    b)  $f'(x)$  is positive  
c)  $f'(x)$  is zero    d) never fails

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**Section – I**

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

- a) Solve  $(D^3 + 2D^2 + D)y = x^2 + x$   
 b) Solve  $(D^2 - 2D + 4)y = e^x \cos^2 x$   
 c) Find  $L\{(t + \sin t)^2\}$   
 d) Find  $L^{-1}\left\{\frac{s}{(s-3)(s^2+4)}\right\}$   
 e) Find  $Z\left\{\frac{3^k}{k}\right\}, k \geq 1$

**Q.3 Attempt any three of the following questions. 09**

- a) Solve  $(D^2 - 2D + 1)y = x \sin x$   
 b) Find Laplace transform of  
 $f(t) = t, \quad 0 < t < 1$   
 $= 0, \quad 1 < t < 2$   
 If  $f(t) = f(t + 2)$   
 c) Find  $L^{-1}\{\tan^{-1}(s + 1)\}$   
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**Q.4 Attempt any two of the following questions. 10**

- a) An uncharged condenser of capacity C is charged by applying an e.m.f of value  $E \sin nt$  through the leads of an inductance L and negligible resistance. The charge Q on the plate of the condenser satisfies the differential equation.

$$\frac{d^2Q}{dt^2} + \frac{Q}{LC} = \frac{E}{L} \sin nt$$

Prove that charge at any time is given by

$$Q = \frac{E}{2n^2L} [\sin nt - nt \cos nt] \text{ where } n^2 = \frac{1}{LC}$$

- b) Solve  $\frac{d^2y}{dt^2} - 3\frac{dy}{dx} + 2y = 12e^{-2t}$   
 $y(0) = 2, y'(0) = 6$   
 by using Laplace transform  
 c) Find inverse z-transform of

$$F(z) = \frac{z}{(z-2)(z-3)}, 2 < |z| < 3$$

## Section – II

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

09

- a) The lines of regression are  $-4x + 5y = 3$  and  $7x + 6y = -9$

Find

- 1) Means of  $x$  and  $y$
- 2) Coefficient of correlation

- b) Solve for a positive root of  $x^3 - 4x + 1 = 0$  by Regula falsi method correct to two decimal places.

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

$$x + y + z = 6$$

$$x - y + z = 2$$

$$2x - y + 3z = 9$$

- d) In an experiment with 500 seeds in groups of 5 the following results were obtained.

$x:$	0	1	2	3	4	5	Total
$f:$	10	70	150	160	80	30	500

Where  $f$  denotes the number of groups in which  $x$  seeds germinated fit a binomial distribution.

- e) Find the Fourier series for

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- 1) Both mechanics would be free
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- b) Find the coefficient of correlation for the following data.

$$N = 25, \sum x = 120, \sum x^2 = 650, \sum y = 100, \sum y^2 = 450, \sum xy = 500$$

- c) Find the positive real root of  $4x - e^x = 0$  that lies between 2 and 3 by Newton's method correct to 3 decimal places.

- d) Find the Fourier cosine expansion of

$$f(x) = c - x \quad 0 < x < c$$

- e) Find the numerically largest eigen value of  $A = \begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$

And the corresponding eigen vector.

Taking  $\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$  as initial eigen vector.

(perform 3 iterations)

**Q.7 Attempt ant two of the following questions.**

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- a) Solve by Jacobis iteration method, the equations

$$20x + y - 2z = 17$$

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

(perform 4 iterations)

- b) Find the Fourier series expansion of  $f(x) = 2 - \frac{x^2}{2}$ ,  $0 \leq x \leq 2$

- c) The customer accounts of a certain departmental store have an average balance of Rs.120 and a standard deviation of Rs.40 Assuming that the distribution of account balances is normal. Find the proportion of accounts.
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- (Given: for a SNV Z area from  
 $z = 0$  to  $z = 0.75$  is 0.2734, that from  
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## Section – II

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Find

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- b) Find the coefficient of correlation for the following data.

$$N = 25, \sum x = 120, \sum x^2 = 650, \sum y = 100, \sum y^2 = 450, \sum xy = 500$$

- c) Find the positive real root of  $4x - e^x = 0$  that lies between 2 and 3 by Newton's method correct to 3 decimal places.

- d) Find the Fourier cosine expansion of

$$f(x) = c - x \quad 0 < x < c$$

- e) Find the numerically largest eigen value of  $A = \begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$

And the corresponding eigen vector.

Taking  $\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$  as initial eigen vector.

(perform 3 iterations)

**Q.7 Attempt ant two of the following questions.**

10

- a) Solve by Jacobis iteration method, the equations

$$20x + y - 2z = 17$$

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

(perform 4 iterations)

- b) Find the Fourier series expansion of  $f(x) = 2 - \frac{x^2}{2}, 0 \leq x \leq 2$

- c) The customer accounts of a certain departmental store have an average balance of Rs.120 and a standard deviation of Rs.40 Assuming that the distribution of account balances is normal. Find the proportion of accounts.
- 1) over Rs. 150
  - 2) between Rs. 100 and Rs. 150
  - 3) between Rs. 60 and Rs. 90
- (Given: for a SNV Z area from  
 $z = 0$  to  $z = 0.75$  is 0.2734, that from  
 $z = 0$  to  $z = 0.5$  is 0.1915  
 $z = 0$  to  $z = 1.5$  is 0.4332)

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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory should be solved in first 30 minutes in answer book.  
2) Use of non programmable calculator is allowed.  
3) 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**

- A continuous random variable has the following density function  
 $f(x) = kx, 0 \leq x \leq 2$ , Then  $k =$  \_\_\_\_\_.  
a)  $1/2$  b)  $1/4$   
c)  $3/2$  d)  $3/4$
- The conditions of expansions of function in Fourier series are known as \_\_\_\_\_.  
a) Harmonic b) Cauchy  
c) Riemann's conditions d) Dirichlet's conditions
- The value of coefficient of correlation  $r$  lies between \_\_\_\_\_.  
a) -2 and 1 b) -1 and 1  
c) 1 and 2 d) 2 and 3
- Which of the following method is used to determine numerically largest eigen value and corresponding eigen vector of given matrix?  
a) Gauss Seidal method b) Gauss Elimination  
c) Power method d) Newton's method
- The Newton Raphson method fails when \_\_\_\_\_.  
a)  $f'(x)$  is negative b)  $f'(x)$  is positive  
c)  $f'(x)$  is zero d) never fails
- For  $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$ , The particular integral is \_\_\_\_\_.  
a)  $c_1e^{-x} + c_2e^{-3x}$  b)  $\frac{1}{15}e^{2x}$   
c)  $\frac{1}{5}e^{2x}$  d)  $3e^{2x}$
- $\frac{1}{D+m}X =$  \_\_\_\_\_.  
a)  $e^{-mx} \int X e^{mx} dx$  b)  $e^{mx} \int X e^{-mx} dx$   
c)  $e^{-mx} \int X dx$  d)  $e^{mx} \int X dx$
- $L\{e^{-t} \sinh t\} =$  \_\_\_\_\_.  
a)  $\frac{1}{s(s-2)}$  b)  $\frac{1}{s^2+2s+2}$   
c)  $\frac{1}{s^2-2s+2}$  d)  $\frac{1}{s(s+2)}$



- 9) Which of the following is true?
- a)  $L^{-1}\{\phi'(s)\} = tL^{-1}\{\phi(s)\}$       b)  $L^{-1}\{\phi'(s)\} = -tL^{-1}\{\phi(s)\}$
- c)  $L^{-1}\{\phi'(s)\} = \frac{-1}{t}L^{-1}\{\phi(s)\}$       d)  $L^{-1}\{\phi'(s)\} = \frac{1}{t}L^{-1}\{\phi(s)\}$
- 10)  $L^{-1}\left\{\frac{1}{\sqrt{s}}\right\} = \underline{\hspace{2cm}}$ .
- a)  $\sqrt{\frac{\pi}{t}}$       b)  $\frac{1}{\sqrt{\pi t}}$
- c)  $\sqrt{\frac{t}{\pi}}$       d)  $\frac{t}{\sqrt{\pi}}$
- 11) If  $U(K) = \begin{cases} 1, & K \geq 0 \\ 0, & K < 0 \end{cases}$  then  $Z\{U(K)\} = \underline{\hspace{2cm}}$ .
- a)  $\frac{1}{z-1}$       b)  $\frac{1}{1-z}$
- c)  $\frac{z}{z-1}$       d)  $\frac{z}{1-z}$
- 12) If  $z\{f(k)\} = F(z)$ , then  $z\{a^k f(k)\} = \underline{\hspace{2cm}}$ .
- a)  $F\left(\frac{z}{a}\right)$       b)  $\frac{1}{a}F\left(\frac{z}{a}\right)$
- c)  $F\left(\frac{a}{z}\right)$       d)  $\frac{1}{z}F\left(\frac{a}{z}\right)$
- 13) In half range cosine series for  $f(x) = (x-1)^2, 0 \leq x \leq 1$  the constant term is  $\underline{\hspace{2cm}}$ .
- a)  $1/3$       b)  $-1/3$
- c) 0      d) 1
- 14) The equations of lines of regression are  $x + 2y = 5$  and  $2x + 3y = 8$  then mean  $\bar{x}$  and  $\bar{y}$  are  $\underline{\hspace{2cm}}$ .
- a) 1 and 3      b) 2 and 3
- c) 2 and 5      d) 1 and 2

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

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Use of non programmable calculator is allowed.  
 3) Figures to the right indicates full marks.

**Section – I**

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

- a) Solve  $(D^3 + 2D^2 + D)y = x^2 + x$   
 b) Solve  $(D^2 - 2D + 4)y = e^x \cos^2 x$   
 c) Find  $L\{(t + \sin t)^2\}$   
 d) Find  $L^{-1}\left\{\frac{s}{(s-3)(s^2+4)}\right\}$   
 e) Find  $Z\left\{\frac{3^k}{k}\right\}, k \geq 1$

**Q.3 Attempt any three of the following questions. 09**

- a) Solve  $(D^2 - 2D + 1)y = x \sin x$   
 b) Find Laplace transform of  
 $f(t) = t, \quad 0 < t < 1$   
 $= 0, \quad 1 < t < 2$   
 If  $f(t) = f(t + 2)$   
 c) Find  $L^{-1}\{\tan^{-1}(s + 1)\}$   
 d) Find  $Z\{ka^k\}, k \geq 0$   
 e) Find  $Z^{-1}\left\{\frac{1}{(z-3)^2}\right\}, |z| > 3$

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

- a) An uncharged condenser of capacity C is charged by applying an e.m.f of value  $E \sin nt$  through the leads of an inductance L and negligible resistance. The charge Q on the plate of the condenser satisfies the differential equation.

$$\frac{d^2Q}{dt^2} + \frac{Q}{LC} = \frac{E}{L} \sin nt$$

Prove that charge at any time is given by

$$Q = \frac{E}{2n^2L} [\sin nt - nt \cos nt] \text{ where } n^2 = \frac{1}{LC}$$

- b) Solve  $\frac{d^2y}{dt^2} - 3\frac{dy}{dx} + 2y = 12e^{-2t}$   
 $y(0) = 2, y'(0) = 6$   
 by using Laplace transform  
 c) Find inverse z-transform of

$$F(z) = \frac{z}{(z-2)(z-3)}, 2 < |z| < 3$$

## Section – II

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

09

- a) The lines of regression are  $-4x + 5y = 3$  and  $7x + 6y = -9$

Find

- 1) Means of  $x$  and  $y$
- 2) Coefficient of correlation

- b) Solve for a positive root of  $x^3 - 4x + 1 = 0$  by Regula falsi method correct to two decimal places.

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

$$x + y + z = 6$$

$$x - y + z = 2$$

$$2x - y + 3z = 9$$

- d) In an experiment with 500 seeds in groups of 5 the following results were obtained.

$x:$	0	1	2	3	4	5	Total
$f:$	10	70	150	160	80	30	500

Where  $f$  denotes the number of groups in which  $x$  seeds germinated fit a binomial distribution.

- e) Find the Fourier series for

$$f(x) = x^3 \text{ in } (-\pi, \pi)$$

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

09

- a) A manufacturer finds that average demand. Per day for the mechanic to repair his new production is 1.5 over a period of one year the demand per day is distributed as Poisson distribution. He employs two mechanics on how many days in one year.

- 1) Both mechanics would be free
- 2) Some demand is refused

- b) Find the coefficient of correlation for the following data.

$$N = 25, \sum x = 120, \sum x^2 = 650, \sum y = 100, \sum y^2 = 450, \sum xy = 500$$

- c) Find the positive real root of  $4x - e^x = 0$  that lies between 2 and 3 by Newton's method correct to 3 decimal places.

- d) Find the Fourier cosine expansion of

$$f(x) = c - x \quad 0 < x < c$$

- e) Find the numerically largest eigen value of  $A = \begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$

And the corresponding eigen vector.

Taking  $\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$  as initial eigen vector.

(perform 3 iterations)

**Q.7 Attempt ant two of the following questions.**

10

- a) Solve by Jacobis iteration method, the equations

$$20x + y - 2z = 17$$

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

(perform 4 iterations)

- b) Find the Fourier series expansion of  $f(x) = 2 - \frac{x^2}{2}$ ,  $0 \leq x \leq 2$

- c) The customer accounts of a certain departmental store have an average balance of Rs.120 and a standard deviation of Rs.40 Assuming that the distribution of account balances is normal. Find the proportion of accounts.
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- (Given: for a SNV Z area from  
 $z = 0$  to  $z = 0.75$  is 0.2734, that from  
 $z = 0$  to  $z = 0.5$  is 0.1915  
 $z = 0$  to  $z = 1.5$  is 0.4332)

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

**Electronics Engineering**

**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

Day &amp; 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 required
- 3) Figures to the right indicate full marks.
- 4) Use of data sheet is allowed.

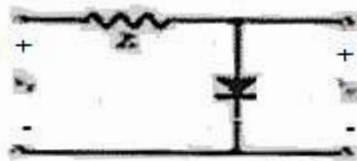
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) The load and line regulation of ideal power supply must be \_\_\_\_\_.
  - a) Zero
  - b) Infinite
  - c) Large
  - d) None
- 2) If the load resistance of a capacitor filter is increases then ripple factor \_\_\_\_\_.
  - a) Increases
  - b) Decreases
  - c) Remains constant
  - d) Exponentionally increases
- 3) The ripple frequency for half wave voltage doubler circuit is \_\_\_\_\_.
  - a) Same as input frequency
  - b) Twice the input frequency
  - c) Half of supply frequency
  - d) Nearly equal to zero
- 4) The function of bleeder resistor in power supply is.
  - a) to provide discharging path for capacitor
  - b) it improves regulation characteristics
  - c) both a & b
  - d) is same as load resistor
- 5) The circuit shown below is \_\_\_\_\_.



- a) Positive clipper
  - b) Negative clipper
  - c) Half wave rectifier
  - d) Clamper
- 6) Forward drop across diode will \_\_\_\_\_ with increase in temperature.
    - a) Increases
    - b) Decreases
    - c) Remains same
    - d) Becomes zero
  - 7) The PIV for bridge rectifier is \_\_\_\_\_.
    - a)  $2V_m$
    - b)  $V_m$
    - c)  $\frac{v_m}{2}$
    - d)  $v_m/\sqrt{2}$

- 8) Gain of an amplifier fall at high frequency due to \_\_\_\_\_.  
a) Coupling capacitor                      b) Bypass capacitor  
c) Junction capacitance                      d) Both a & b
- 9) The process of base width modulation in transistor is called as \_\_\_\_\_.  
a) Biasing                                      b) Thermal runaway  
c) Early effect                                d) Compensation
- 10) Input resistance CE amplifier is \_\_\_\_\_.  
a)  $h_{fe}$     b)  $H_{oe}$   
c)  $h_{ie}$     d)  $H_{re}$
- 11) For amplifier component values are  $h_{fe}=200$ ,  $R_L=10K\Omega$ ,  $h_{ie}=1K\Omega$ ,  $R_s=0$ , the voltage gain is \_\_\_\_\_.  
a) 2000.00                                      b) 1666.66  
c) 1768.86                                      d) None of these
- 12) The JFET is a \_\_\_\_\_.  
a) Current controlled device with high input resistance  
b) Current controlled device with low input resistance  
c) Voltage controlled device with high input resistance  
d) Voltage controlled device with low input resistance
- 13) The correct statement is \_\_\_\_\_.  
a) Monostable converts sine wave to square wave  
b) Astable converts sine wave to square wave  
c) Schmitt converts sine wave to square wave  
d) None of these
- 14) A 1 msec pulse can be stretched to 1 sec using \_\_\_\_\_.  
a) Astable multivibrator                      b) Schmitt Trigger  
c) Monostable multivibrator                d) None of these

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

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

Max. Marks: 56

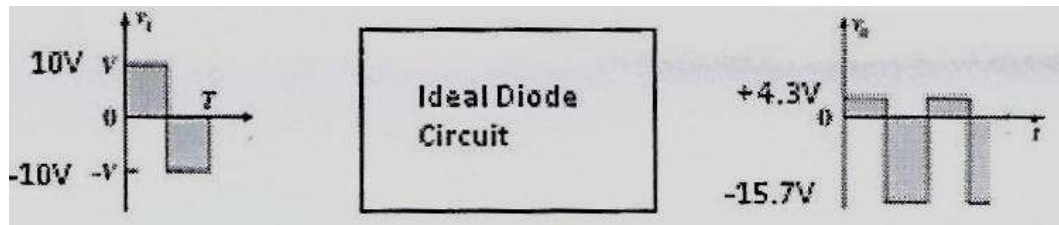
- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required  
 3) Figures to the right indicate full marks.  
 4) Use of data sheet is allowed.

**Section – I****Q.2 Attempt any four****16**

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
- Describe operation of series positive and series negative clipper. Also draw transfer characteristics curve.
- Explain any three application of Zener diode with suitable circuit diagram.
- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.

**Section – II****Q.4 Attempt any four****16**

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
- Explain drain and transfer characteristics of N channel DMOSFET.
- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with  $P_D=250\text{mW}$ ,  $h_{fe}=250$ ,  $h_{ie}=4.8\text{K}\Omega$ ,  $1/h_{oe}=1\text{M}\Omega$ .
- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.

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

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

Max. Marks: 70

- 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) Gain of an amplifier fall at high frequency due to \_\_\_\_\_.  
 a) Coupling capacitor                      b) Bypass capacitor  
 c) Junction capacitance                      d) Both a & b
- 2) The process of base width modulation in transistor is called as \_\_\_\_\_.  
 a) Biasing                                      b) Thermal runaway  
 c) Early effect                                      d) Compensation
- 3) Input resistance CE amplifier is \_\_\_\_\_.  
 a)  $h_{fe}$     b)  $H_{oe}$   
 c)  $h_{ie}$     d)  $H_{re}$
- 4) For amplifier component values are  $h_{fe}=200$ ,  $R_L=10K\Omega$ ,  $h_{ie}=1K\Omega$ ,  $R_s=0$ , the voltage gain is \_\_\_\_\_.  
 a) 2000.00    b) 1666.66  
 c) 1768.86    d) None of these
- 5) The JFET is a \_\_\_\_\_.  
 a) Current controlled device with high input resistance  
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 a) Astable multivibrator                      b) Schmitt Trigger  
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- 8) The load and line regulation of ideal power supply must be \_\_\_\_\_.  
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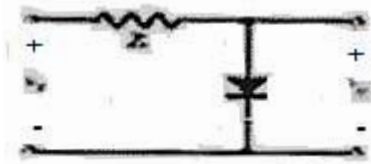
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- b) Negative clipper
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- d) Clamper

13) Forward drop across diode will \_\_\_\_\_ with increase in temperature.

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- c) Remains same
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14) The PIV for bridge rectifier is \_\_\_\_\_.

- a)  $2V_m$
- b)  $V_m$
- c)  $\frac{v_m}{2}$
- d)  $v_m/\sqrt{2}$

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

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

Max. Marks: 56

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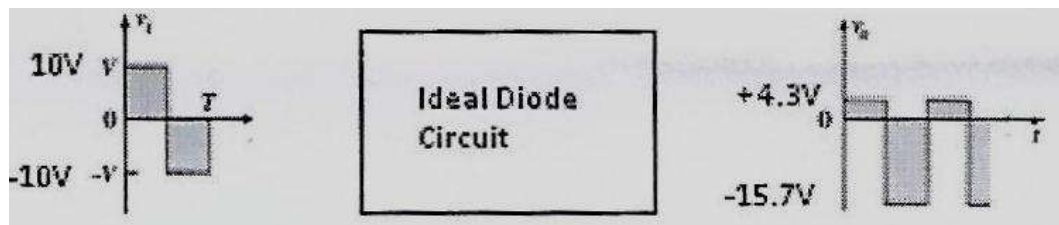
**Section – I**

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- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.



**Section – II**

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

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
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- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with  $P_D=250\text{mW}$ ,  $h_{fe}=250$ ,  $h_{ie}=4.8\text{K}\Omega$ ,  $1/h_{oe}=1\text{M}\Omega$ .
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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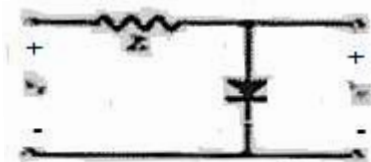
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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 d) Clamper
- 2) Forward drop across diode will \_\_\_\_\_ with increase in temperature.  
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- 3) The PIV for bridge rectifier is \_\_\_\_\_.  
 a)  $2V_m$   
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 a) 2000.00  
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- 9) The correct statement is \_\_\_\_\_.
- a) Monostable converts sine wave to square wave
  - b) Astable converts sine wave to square wave
  - c) Schmitt converts sine wave to square wave
  - d) None of these
- 10) A 1 msec pulse can be stretched to 1 sec using \_\_\_\_\_.
- a) Astable multivibrator
  - b) Schmitt Trigger
  - c) Monostable multivibrator
  - d) None of these
- 11) The load and line regulation of ideal power supply must be \_\_\_\_\_.
- a) Zero
  - b) Infinite
  - c) Large
  - d) None
- 12) If the load resistance of a capacitor filter is increases then ripple factor \_\_\_\_\_.
- a) Increases
  - b) Decreases
  - c) Remains constant
  - d) Exponentionally increases
- 13) The ripple frequency for half wave voltage doubler circuit is \_\_\_\_\_.
- a) Same as input frequency
  - b) Twice the input frequency
  - c) Half of supply frequency
  - d) Nearly equal to zero
- 14) The function of bleeder resistor in power supply is.
- a) to provide discharging path for capacitor
  - b) it improves regulation characteristics
  - c) both a & b
  - d) is same as load resistor

Seat  
No.

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

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

Max. Marks: 56

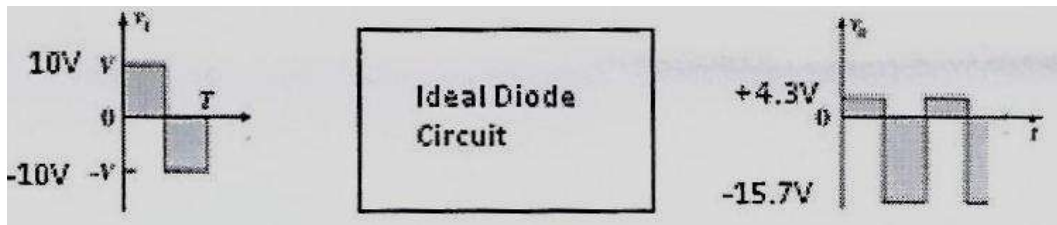
- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required  
 3) Figures to the right indicate full marks.  
 4) Use of data sheet is allowed.

**Section – I****Q.2 Attempt any four****16**

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
- Describe operation of series positive and series negative clipper. Also draw transfer characteristics curve.
- Explain any three application of Zener diode with suitable circuit diagram.
- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.

**Section – II****Q.4 Attempt any four****16**

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
- Explain drain and transfer characteristics of N channel DMOSFET.
- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with  $P_D=250\text{mW}$ ,  $h_{fe}=250$ ,  $h_{ie}=4.8\text{K}\Omega$ ,  $1/h_{oe}=1\text{M}\Omega$ .
- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.

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

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

Max. Marks: 70

- 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.  
 4) Use of data sheet is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

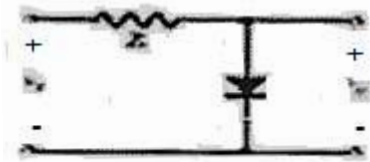
Marks: 14

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

- 1) Input resistance CE amplifier is \_\_\_\_\_.
  - a)  $h_{fe}$
  - b)  $H_{oe}$
  - c)  $h_{ie}$
  - d)  $H_{re}$
- 2) For amplifier component values are  $h_{fe}=200$ ,  $R_L=10K\Omega$ ,  $h_{ie}=1K\Omega$ ,  $R_s=0$ , the voltage gain is \_\_\_\_\_.
  - a) 2000.00
  - b) 1666.66
  - c) 1768.86
  - d) None of these
- 3) The JFET is a \_\_\_\_\_.
  - a) Current controlled device with high input resistance
  - b) Current controlled device with low input resistance
  - c) Voltage controlled device with high input resistance
  - d) Voltage controlled device with low input resistance
- 4) The correct statement is \_\_\_\_\_.
  - a) Monostable converts sine wave to square wave
  - b) Astable converts sine wave to square wave
  - c) Schmitt converts sine wave to square wave
  - d) None of these
- 5) A 1 msec pulse can be stretched to 1 sec using \_\_\_\_\_.
  - a) Astable multivibrator
  - b) Schmitt Trigger
  - c) Monostable multivibrator
  - d) None of these
- 6) The load and line regulation of ideal power supply must be \_\_\_\_\_.
  - a) Zero
  - b) Infinite
  - c) Large
  - d) None
- 7) If the load resistance of a capacitor filter is increases then ripple factor \_\_\_\_\_.
  - a) Increases
  - b) Decreases
  - c) Remains constant
  - d) Exponentially increases
- 8) The ripple frequency for half wave voltage doubler circuit is \_\_\_\_\_.
  - a) Same as input frequency
  - b) Twice the input frequency
  - c) Half of supply frequency
  - d) Nearly equal to zero

- 9) The function of bleeder resistor in power supply is.
- to provide discharging path for capacitor
  - it improves regulation characteristics
  - both a & b
  - is same as load resistor

- 10) The circuit shown below is \_\_\_\_\_.



- Positive clipper
  - Negative clipper
  - Half wave rectifier
  - Clamper
- 11) Forward drop across diode will \_\_\_\_\_ with increase in temperature.
- Increases
  - Decreases
  - Remains same
  - Becomes zero
- 12) The PIV for bridge rectifier is \_\_\_\_\_.
- $2V_m$
  - $V_m$
  - $\frac{v_m}{2}$
  - $v_m/\sqrt{2}$
- 13) Gain of an amplifier fall at high frequency due to \_\_\_\_\_.
- Coupling capacitor
  - Bypass capacitor
  - Junction capacitance
  - Both a & b
- 14) The process of base width modulation in transistor is called as \_\_\_\_\_.
- Biasing
  - Thermal runaway
  - Early effect
  - Compensation

Seat  
No.

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

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

Max. Marks: 56

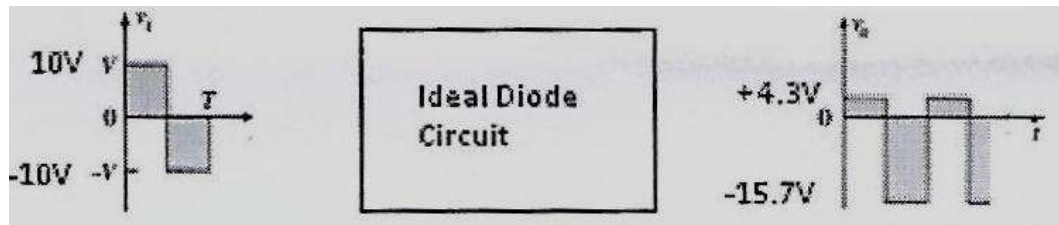
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**Section – I****Q.2 Attempt any four****16**

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
- Describe operation of series positive and series negative clipper. Also draw transfer characteristics curve.
- Explain any three application of Zener diode with suitable circuit diagram.
- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.

**Section – II****Q.4 Attempt any four****16**

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
- Explain drain and transfer characteristics of N channel DMOSFET.
- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with  $P_D=250\text{mW}$ ,  $h_{fe}=250$ ,  $h_{ie}=4.8\text{K}\Omega$ ,  $1/h_{oe}=1\text{M}\Omega$ .
- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.



<b>Seat No.</b>	
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**S.E. (Part - I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**NETWORK THEORY & ANALYSIS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
 2) All questions are compulsory.  
 3) Assume the suitable 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 time constant of a series RC circuit is \_\_\_\_\_.
 

a) $RC$	b) $\frac{C}{R}$
c) $\frac{R}{C}$	d) $e^{-RLC}$
- 2) The function is said to be having simple poles and zeros only if \_\_\_\_\_.
  - a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above
- 3) Cascade connection of LPF with cutoff frequency  $f_1$  and HPF with cutoff frequency  $f_2$  gives band pass filter if \_\_\_\_\_.
 

a) $f_1 < f_2$	b) $f_1 > f_2$
c) $f_1 = f_2$	d) none of the above
- 4) The Z parameters  $Z_{11}$  and  $Z_{21}$  are obtained by \_\_\_\_\_.
 

a) by shorting input terminals	b) by opening input terminals
c) by shorting output terminals	d) by opening output terminals
- 5) If the degree of the node is two, then it indicates that two branches are incident at node and these are in \_\_\_\_\_.
 

a) Series	b) Parallel
c) Both a) & b)	d) None
- 6) Maximum power is transferred when the load impedance is equal to \_\_\_\_\_.
 

a) Source impedance	b) Zero
c) Half of Source Impedance	d) None
- 7) If the lower cutoff frequency is 2400 Hz and the upper cut off frequency is 2800 Hz, what is the bandwidth?
 

a) 400Hz	b) 2400Hz
c) 2800Hz	d) 5200Hz
- 8) The s-domain equivalent of the inductor reduces to an inductor with impedance?
 

a) $L$	b) $SL$
c) $S^2L$	d) $S^3L$

- 9) Mesh Analysis is based on \_\_\_\_\_.  
 a) Kirchhoff's Voltage Law                      b) Kirchhoff's Current Law  
 c) None
- 10) For an R-L-C circuit, we get  $[D - (K1 + K2)][D - (K1 - K2)] i = 0$ . If K2 is positive, then the curve will be?  
 a) Damped    b) over damped  
 c) under damped                                      d) critically damped
- 11) The two port network is said to be symmetrical if \_\_\_\_\_.  
 a)  $Y_{11}=Y_{22}$                                       b)  $Z_{12} = Z_{21}$   
 c)  $A = C$     d) None
- 12) Inductor has a property that it doesn't allow sudden changes in \_\_\_\_\_.  
 a) Current    b) Voltages  
 c) L    d) None
- 13) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.  
 a) C    b)  $\omega RC$   
 c)  $\omega C$     d)  $1/\omega RC$
- 14) The relation between  $Z_{0\pi}, Z_1, Z_2, Z_{0T}$  is given as \_\_\_\_\_.  
 a)  $Z_{0T} = \frac{Z_1 Z_1}{Z_{0\pi}}$                                       b)  $Z_{0T} = \frac{Z_2 Z_2}{Z_{0\pi}}$   
 c)  $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$                                       d) None

Seat  
No.

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

**Electronics Engineering**  
**NETWORK THEORY & ANALYSIS**

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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

**Section - I**

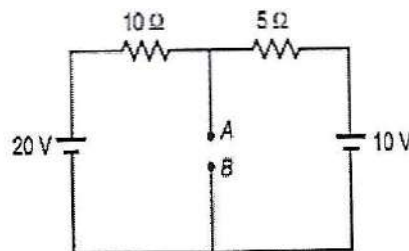
**Q.2 Attempt any Four:**

16

- State and Prove Maximum Power Transfer theorem with an example.
- A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

$$I_2 = -V_1 + 5V_2$$
 Find the equivalent  $\pi$ -network
- Determine the Norton's equivalent circuit at terminals AB for the circuit show below

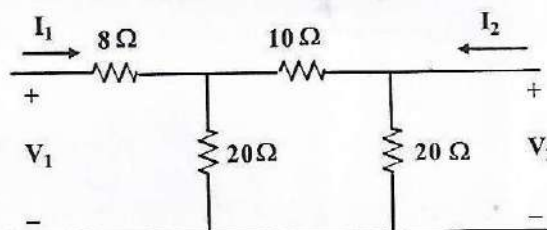


- In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu\text{f}$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

**Q.3 Attempt any Two:**

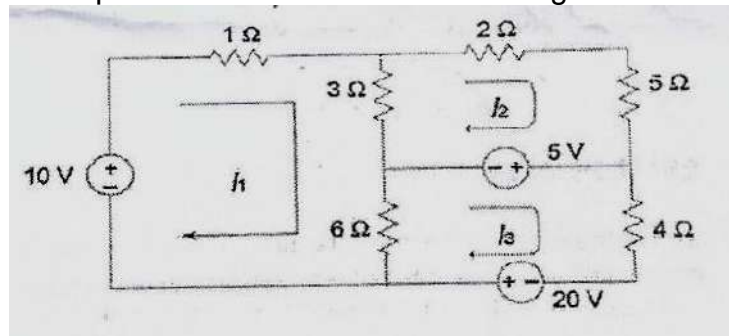
12

- Find the Z parameters for the circuit shown



- Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{X_L}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

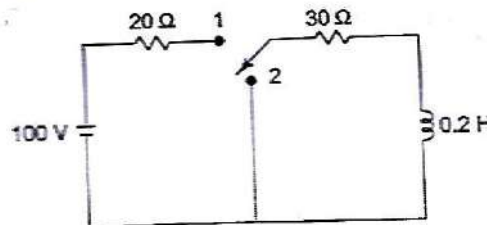


Section - II

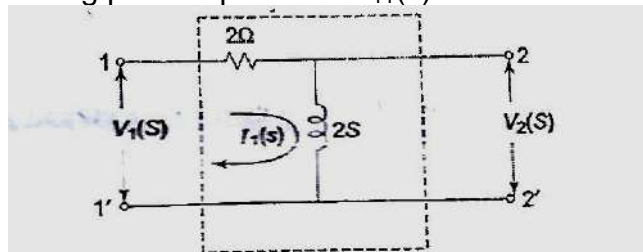
Q.4 Attempt any four:

16

- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
 c) For the network shown in figure, obtain the transfer functions  $G_{21}(s)$  and  $Z_{21}(s)$  and the driving point impedance  $Z_{11}(s)$ .



- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500 \Omega$ .  
 e) Design a T -pad attenuator to give an attenuation of 60 dB and to work in a line of  $500 \Omega$  impedance.

Q.5 Attempt any two.

12

- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
 c) Explain the Routh Criteria for stability. For the given denominator polynomial of the network function, verify the stability of the network function using Routh criteria.

$$Q(S) = S^4 + S^3 + 2S^2 + 2S + 12$$

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

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

Max. Marks: 70

- 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) The s-domain equivalent of the inductor reduces to an inductor with impedance?
  - a) L
  - b)  $SL$
  - c)  $S^2L$
  - d)  $S^3L$
- 2) Mesh Analysis is based on \_\_\_\_\_.
  - a) Kirchhoff's Voltage Law
  - b) Kirchhoff's Current Law
  - c) None
- 3) For an R-L-C circuit, we get  $[D - (K_1 + K_2)][D - (K_1 - K_2)]i = 0$ . If  $K_2$  is positive, then the curve will be?
  - a) Damped
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  - d) critically damped
- 4) The two port network is said to be symmetrical if \_\_\_\_\_.
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  - b)  $Z_{12} = Z_{21}$
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  - a) Current
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  - c) L
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- 6) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.
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  - b)  $\omega RC$
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  - b)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - c)  $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$
  - d) None
- 8) The time constant of a series RC circuit is \_\_\_\_\_.
  - a) RC
  - b)  $\frac{C}{R}$
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- 10) Cascade connection of LPF with cutoff frequency  $f_1$  and HPF with cutoff frequency  $f_2$  gives band pass filter if \_\_\_\_\_.
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- 12) If the degree of the node is two, then it indicates that two branches are incident at node and these are in \_\_\_\_\_.
- a) Series
  - b) Parallel
  - c) Both a) & b)
  - d) None
- 13) Maximum power is transferred when the load impedance is equal to \_\_\_\_.
- a) Source impedance
  - b) Zero
  - c) Half of Source Impedance
  - d) None
- 14) If the lower cutoff frequency is 2400 Hz and the upper cut off frequency is 2800 Hz, what is the bandwidth?
- a) 400Hz
  - b) 2400Hz
  - c) 2800Hz
  - d) 5200Hz

Seat No.	
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Set	Q
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S.E. (Part - I) (New/Old) (CBCS) Examination Nov/Dec-2019

Electronics Engineering  
NETWORK THEORY & ANALYSIS

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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Section - I

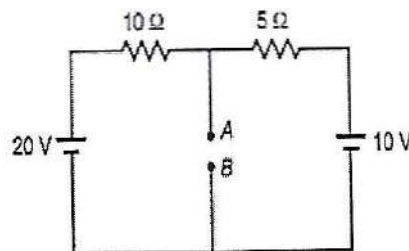
Q.2 Attempt any Four:

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- State and Prove Maximum Power Transfer theorem with an example.
- A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

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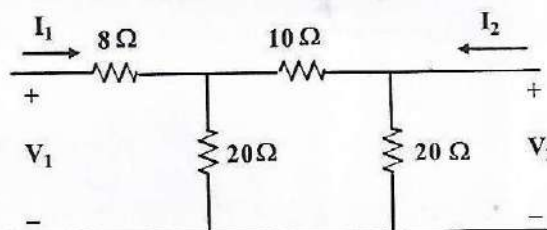


- In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu f$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

Q.3 Attempt any Two:

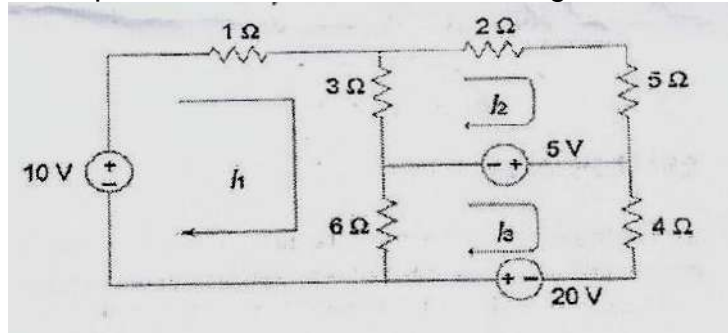
12

- Find the Z parameters for the circuit shown



- Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{XL}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

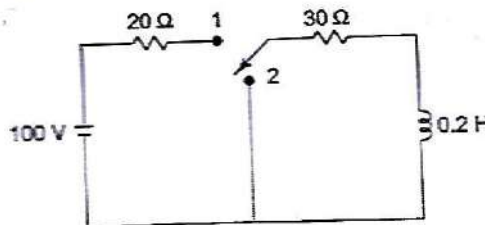


**Section - II**

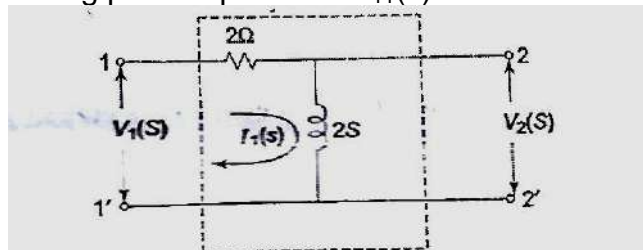
**Q.4 Attempt any four:**

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- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
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- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500\ \Omega$ .  
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**Q.5 Attempt any two.**

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- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
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$$Q(s) = s^4 + s^3 + 2s^2 + 2s + 12$$



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

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

Max. Marks: 70

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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**

- If the degree of the node is two, then it indicates that two branches are incident at node and these are in \_\_\_\_\_.
  - Series
  - Parallel
  - Both a) & b)
  - None
- Maximum power is transferred when the load impedance is equal to \_\_\_\_\_.
  - Source impedance
  - Zero
  - Half of Source Impedance
  - None
- If the lower cutoff frequency is 2400 Hz and the upper cut off frequency is 2800 Hz, what is the bandwidth?
  - 400Hz
  - 2400Hz
  - 2800Hz
  - 5200Hz
- The s-domain equivalent of the inductor reduces to an inductor with impedance?
  - L
  - SL
  - S<sup>2</sup>L
  - S<sup>3</sup>L
- Mesh Analysis is based on \_\_\_\_\_.
  - Kirchhoff's Voltage Law
  - Kirchhoff's Current Law
  - None
- For an R-L-C circuit, we get  $[D - (K_1 + K_2)][D - (K_1 - K_2)]i = 0$ . If K<sub>2</sub> is positive, then the curve will be?
  - Damped
  - over damped
  - under damped
  - critically damped
- The two port network is said to be symmetrical if \_\_\_\_\_.
  - $Y_{11} = Y_{22}$
  - $Z_{12} = Z_{21}$
  - $A = C$
  - None
- Inductor has a property that it doesn't allow sudden changes in \_\_\_\_\_.
  - Current
  - Voltages
  - L
  - None
- If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.
  - C
  - $\omega RC$
  - $\omega C$
  - $1/\omega RC$

- 10) The relation between  $Z_{0\pi}$ ,  $Z_1$ ,  $Z_2$ ,  $Z_{0T}$  is given as \_\_\_\_\_.
- a)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - b)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - c)  $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$
  - d) None
- 11) The time constant of a series RC circuit is \_\_\_\_\_.
- a)  $RC$
  - b)  $\frac{C}{R}$
  - c)  $\frac{R}{C}$
  - d)  $e^{-RLC}$
- 12) The function is said to be having simple poles and zeros only if \_\_\_\_\_.
- a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above
- 13) Cascade connection of LPF with cutoff frequency  $f_1$  and HPF with cutoff frequency  $f_2$  gives band pass filter if \_\_\_\_\_.
- a)  $f_1 < f_2$
  - b)  $f_1 > f_2$
  - c)  $f_1 = f_2$
  - d) none of the above
- 14) The Z parameters  $Z_{11}$  and  $Z_{21}$  are obtained by \_\_\_\_\_.
- a) by shorting input terminals
  - b) by opening input terminals
  - c) by shorting output terminals
  - d) by opening output terminals

Seat  
No.

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

**Electronics Engineering**  
**NETWORK THEORY & ANALYSIS**

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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

**Section - I**

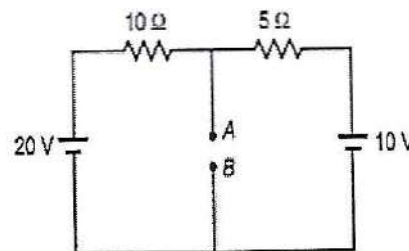
**Q.2 Attempt any Four:**

16

- a) State and Prove Maximum Power Transfer theorem with an example.
- b) A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- c) The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

$$I_2 = -V_1 + 5V_2$$
 Find the equivalent  $\pi$ -network
- d) Determine the Norton's equivalent circuit at terminals AB for the circuit show below

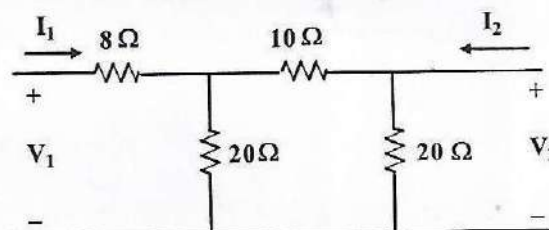


- e) In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu\text{f}$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

**Q.3 Attempt any Two:**

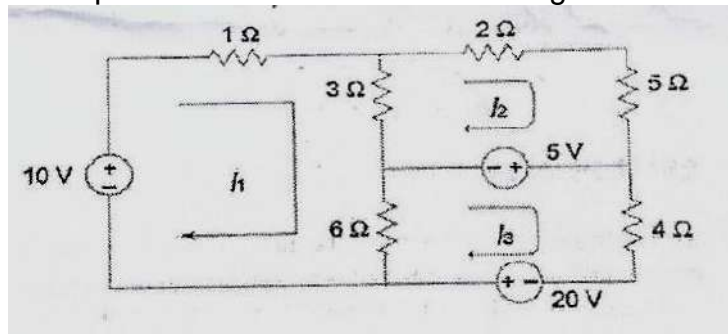
12

- a) Find the Z parameters for the circuit shown



- b) Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{X_L}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

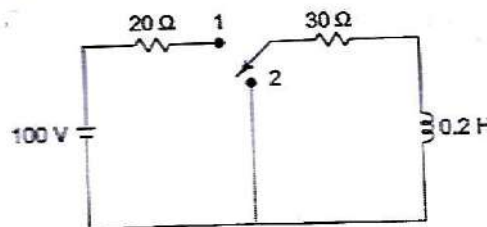


Section - II

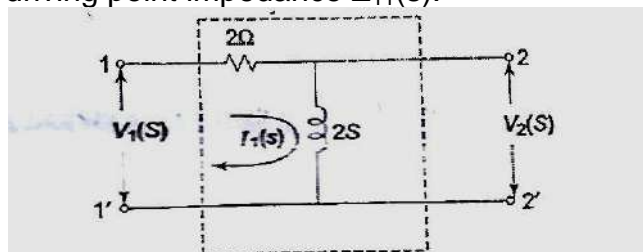
Q.4 Attempt any four:

16

- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
 c) For the network shown in figure, obtain the transfer functions  $G_{21}(s)$  and  $Z_{21}(s)$  and the driving point impedance  $Z_{11}(s)$ .



- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500\ \Omega$ .  
 e) Design a T -pad attenuator to give an attenuation of 60 dB and to work in a line of  $500\ \Omega$  impedance.

Q.5 Attempt any two.

12

- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
 c) Explain the Routh Criteria for stability. For the given denominator polynomial of the network function, verify the stability of the network function using Routh criteria.

$$Q(s) = s^4 + s^3 + 2s^2 + 2s + 12$$

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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
 2) All questions are compulsory.  
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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) For an R-L-C circuit, we get  $[D - (K_1 + K_2)][D - (K_1 - K_2)] i = 0$ . If  $K_2$  is positive, then the curve will be?
  - a) Damped
  - b) over damped
  - c) under damped
  - d) critically damped
- 2) The two port network is said to be symmetrical if \_\_\_\_\_.
  - a)  $Y_{11} = Y_{22}$
  - b)  $Z_{12} = Z_{21}$
  - c)  $A = C$
  - d) None
- 3) Inductor has a property that it doesn't allow sudden changes in \_\_\_\_\_.
  - a) Current
  - b) Voltages
  - c) L
  - d) None
- 4) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.
  - a) C
  - b)  $\omega RC$
  - c)  $\omega C$
  - d)  $1/\omega RC$
- 5) The relation between  $Z_{0\pi}, Z_1, Z_2, Z_{0T}$  is given as \_\_\_\_\_.
  - a)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - b)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - c)  $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$
  - d) None
- 6) The time constant of a series RC circuit is \_\_\_\_\_.
  - a) RC
  - b)  $\frac{C}{R}$
  - c)  $\frac{R}{C}$
  - d)  $e^{-RLC}$
- 7) The function is said to be having simple poles and zeros only if \_\_\_\_\_.
  - a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above
- 8) Cascade connection of LPF with cutoff frequency  $f_1$  and HPF with cutoff frequency  $f_2$  gives band pass filter if \_\_\_\_\_.
  - a)  $f_1 < f_2$
  - b)  $f_1 > f_2$
  - c)  $f_1 = f_2$
  - d) none of the above
- 9) The Z parameters  $Z_{11}$  and  $Z_{21}$  are obtained by \_\_\_\_\_.
  - a) by shorting input terminals
  - b) by opening input terminals
  - c) by shorting output terminals
  - d) by opening output terminals

- 10) If the degree of the node is two, then it indicates that two branches are incident at node and these are in \_\_\_\_\_.
- a) Series
  - b) Parallel
  - c) Both a) & b)
  - d) None
- 11) Maximum power is transferred when the load impedance is equal to \_\_\_\_.
- a) Source impedance
  - b) Zero
  - c) Half of Source Impedance
  - d) None
- 12) If the lower cutoff frequency is 2400 Hz and the upper cut off frequency is 2800 Hz, what is the bandwidth?
- a) 400Hz
  - b) 2400Hz
  - c) 2800Hz
  - d) 5200Hz
- 13) The s-domain equivalent of the inductor reduces to an inductor with impedance?
- a)  $L$
  - b)  $SL$
  - c)  $S^2L$
  - d)  $S^3L$
- 14) Mesh Analysis is based on \_\_\_\_\_.
- a) Kirchoff's Voltage Law
  - b) Kirchoff's Current Law
  - c) None

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

Electronics Engineering  
NETWORK THEORY & ANALYSIS

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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

Section - I

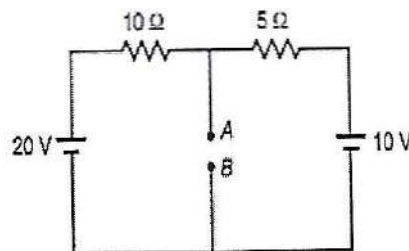
Q.2 Attempt any Four:

16

- State and Prove Maximum Power Transfer theorem with an example.
- A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

$$I_2 = -V_1 + 5V_2$$
 Find the equivalent  $\pi$ -network
- Determine the Norton's equivalent circuit at terminals AB for the circuit show below

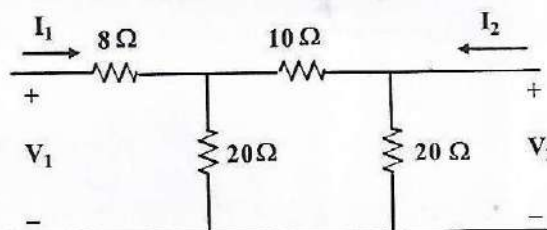


- In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu f$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

Q.3 Attempt any Two:

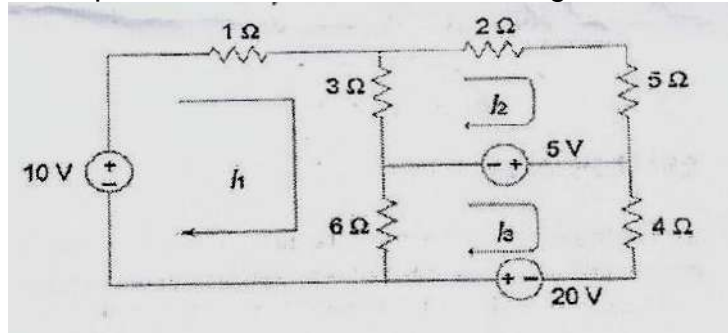
12

- Find the Z parameters for the circuit shown



- Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{X_L}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

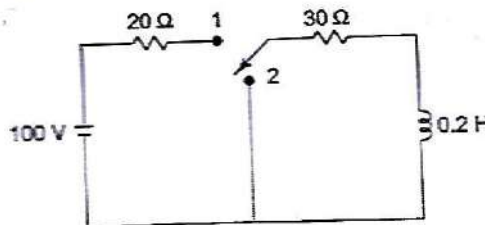


Section - II

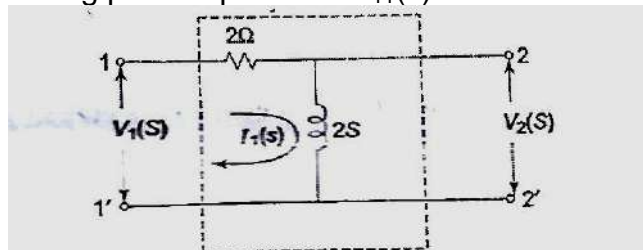
Q.4 Attempt any four:

16

- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
 c) For the network shown in figure, obtain the transfer functions  $G_{21}(s)$  and  $Z_{21}(s)$  and the driving point impedance  $Z_{11}(s)$ .



- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500 \Omega$ .  
 e) Design a T -pad attenuator to give an attenuation of 60 dB and to work in a line of  $500 \Omega$  impedance.

Q.5 Attempt any two.

12

- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
 c) Explain the Routh Criteria for stability. For the given denominator polynomial of the network function, verify the stability of the network function using Routh criteria.

$$Q(S) = S^4 + S^3 + 2S^2 + 2S + 12$$



Seat No.	
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) According to Boolean algebra  $(A+AB)$  equals \_\_\_\_\_.
  - a) A
  - b) B
  - c) AB
  - d)  $A+B$
- 2) A Four Variable K map has a \_\_\_\_\_.
  - a) 8 min-terms
  - b) 16 min-terms
  - c) 32 min-terms
  - d) None of these
- 3) Each term in standard POS form is called as \_\_\_\_\_.
  - a) Minterm
  - b) Maxterm
  - c) Don't care
  - d) Literals
- 4) The NAND-NAND realization is equivalent to \_\_\_\_\_.
  - a) AND-NOT realization
  - b) AND-OR realization
  - c) OR-AND realization
  - d) NOT-OR realization
- 5) 8421 code is \_\_\_\_\_.
  - a) self complimenting code
  - b) weighted code
  - c) non weighted code
  - d) alphanumeric code
- 6) The following code is not a BCD code \_\_\_\_\_.
  - a) Gray code
  - b) XS-3 code
  - c) 8421 code
  - d) all of the above
- 7) A TTL circuit acts as a current source in the \_\_\_\_\_.
  - a) low state
  - b) high state
  - c) high impedance state
  - d) none of these
- 8) A flip flop has \_\_\_\_\_ states.
  - a) Four
  - b) One
  - c) Two
  - d) Three
- 9) The functional difference between S-R flip-flop and J-K flip flop is that \_\_\_\_\_.
  - a) J-K flip-flop is faster than S-R flip-flop
  - b) J-K flip-flop has feedback path
  - c) J-K flip-flop accepts both inputs 1
  - d) J-K flip flop does not require external clock

- 10) The digital circuit that can count clock pulse is called as \_\_\_\_\_.  
a) Latch  
b) Counter  
c) Shift register  
d) Trigger
- 11) A PLA is \_\_\_\_\_.  
a) a LSI device  
b) a MSI device  
c) a SSI Device  
d) a discrete Device
- 12) A combinational PLD with a fixed AND array and programmable OR array is called \_\_\_\_\_.  
a) PLD  
b) PROM  
c) PAL  
d) PLA
- 13) The output of the Moore machine is the function of \_\_\_\_\_.  
a) next state  
b) present inputs  
c) present state and present inputs  
d) present state
- 14) A demultiplexer can be used to realize a \_\_\_\_\_.  
a) Counter  
b) Shift register  
c) Combination circuit  
d) Display system

Seat No.	
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Set **P**

**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10
- b) Design and implement full subtractor using a 4:1 multiplexer.
- c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS
- d) Derive a code table for BCD code 5421 which satisfies self complementary property.
- d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
- b) Design and implement 1:8 de-multiplexer using NAND gates only.
- c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

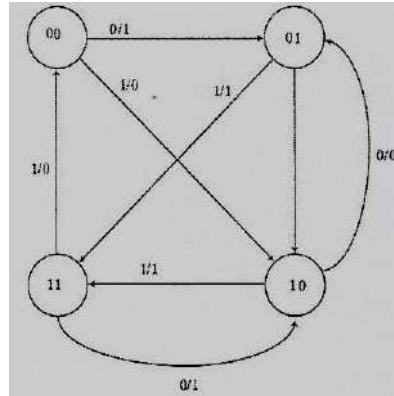
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
- b) Design a 3-bit ripple counter. What is the modulus of the counter?
- c) Design a D flip-flop using T flip-flop.
- d) Draw and explain a 4-bit twisted ring counter using shift register.
- e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.



Seat No.	
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 70

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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) Four	b) One
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a) PLD	b) PROM
c) PAL	d) PLA
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  - b) present inputs
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- 7) A demultiplexer can be used to realize a \_\_\_\_\_.
 

a) Counter	b) Shift register
c) Combination circuit	d) Display system
- 8) According to Boolean algebra  $(A+AB)$  equals \_\_\_\_\_.
 

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c) 8421 code                                        d) all of the above
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a) low state                                         b) high state  
c) high impedance state                        d) none of these

Seat No.	
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Set **Q**

**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

Day & Date: Saturday, 14-12-2019  
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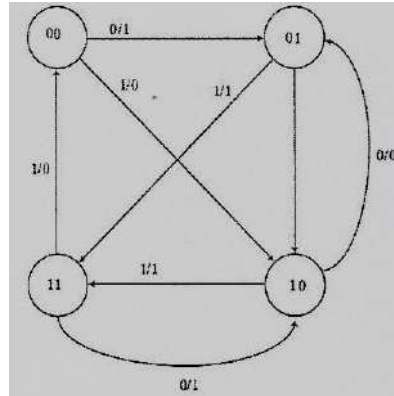
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
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Seat No.	
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Duration: 30 Minutes

Marks: 14

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  - a) self complimenting code
  - b) weighted code
  - c) non weighted code
  - d) alphanumeric code
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  - a) Gray code
  - b) XS-3 code
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  - b) One
  - c) Two
  - d) Three
- 5) The functional difference between S-R flip-flop and J-K flip flop is that \_\_\_\_\_.
  - a) J-K flip-flop is faster than S-R flip-flop
  - b) J-K flip-flop has feedback path
  - c) J-K flip-flop accepts both inputs 1
  - d) J-K flip flop does not require external clock
- 6) The digital circuit that can count clock pulse is called as \_\_\_\_\_.
  - a) Latch
  - b) Counter
  - c) Shift register
  - d) Trigger
- 7) A PLA is \_\_\_\_\_.
  - a) a LSI device
  - b) a MSI device
  - c) a SSI Device
  - d) a discrete Device
- 8) A combinational PLD with a fixed AND array and programmable OR array is called \_\_\_\_\_.
  - a) PLD
  - b) PROM
  - c) PAL
  - d) PLA
- 9) The output of the Moore machine is the function of \_\_\_\_\_.
  - a) next state
  - b) present inputs
  - c) present state and present inputs
  - d) present state

- 10) A demultiplexer can be used to realize a \_\_\_\_\_.
  - a) Counter
  - b) Shift register
  - c) Combination circuit
  - d) Display system
  
- 11) According to Boolean algebra  $(A+AB)$  equals \_\_\_\_\_.
  - a) A
  - b) B
  - c) AB
  - d)  $A+B$
  
- 12) A Four Variable K map has a \_\_\_\_\_.
  - a) 8 min-terms
  - b) 16 min-terms
  - c) 32 min-terms
  - d) None of these
  
- 13) Each term in standard POS form is called as \_\_\_\_\_.
  - a) Minterm
  - b) Maxterm
  - c) Don't care
  - d) Literals
  
- 14) The NAND-NAND realization is equivalent to \_\_\_\_\_.
  - a) AND-NOT realization
  - b) AND-OR realization
  - c) OR-AND realization
  - d) NOT-OR realization

Seat No.	
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Set **R**

**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10  
 b) Design and implement full subtractor using a 4:1 multiplexer.  
 c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS  
 d) Derive a code table for BCD code 5421 which satisfies self complementary property.  
 d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
  
 b) Design and implement 1:8 de-multiplexer using NAND gates only.  
 c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

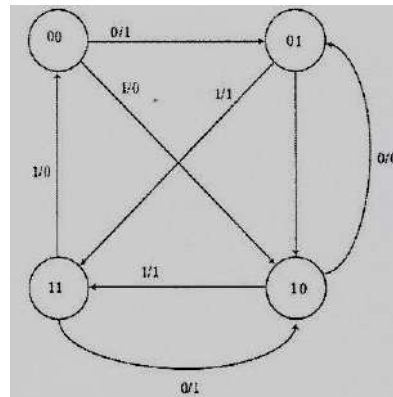
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.  
 b) Design a 3-bit ripple counter. What is the modulus of the counter?  
 c) Design a D flip-flop using T flip-flop.  
 d) Draw and explain a 4-bit twisted ring counter using shift register.  
 e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.



Seat No.	
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Set **S**

**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) The digital circuit that can count clock pulse is called as \_\_\_\_\_.  
 a) Latch  
 b) Counter  
 c) Shift register  
 d) Trigger
- 2) A PLA is \_\_\_\_\_.  
 a) a LSI device  
 b) a MSI device  
 c) a SSI Device  
 d) a discrete Device
- 3) A combinational PLD with a fixed AND array and programmable OR array is called \_\_\_\_\_.  
 a) PLD  
 b) PROM  
 c) PAL  
 d) PLA
- 4) The output of the Moore machine is the function of \_\_\_\_\_.  
 a) next state  
 b) present inputs  
 c) present state and present inputs  
 d) present state
- 5) A demultiplexer can be used to realize a \_\_\_\_\_.  
 a) Counter  
 b) Shift register  
 c) Combination circuit  
 d) Display system
- 6) According to Boolean algebra  $(A+AB)$  equals \_\_\_\_\_.  
 a) A  
 b) B  
 c) AB  
 d) A+B
- 7) A Four Variable K map has a \_\_\_\_\_.  
 a) 8 min-terms  
 b) 16 min-terms  
 c) 32 min-terms  
 d) None of these
- 8) Each term in standard POS form is called as \_\_\_\_\_.  
 a) Minterm  
 b) Maxterm  
 c) Don't care  
 d) Literals
- 9) The NAND-NAND realization is equivalent to \_\_\_\_\_.  
 a) AND-NOT realization  
 b) AND-OR realization  
 c) OR-AND realization  
 d) NOT-OR realization
- 10) 8421 code is \_\_\_\_\_.  
 a) self complimenting code  
 b) weighted code  
 c) non weighted code  
 d) alphanumeric code

- 11) The following code is not a BCD code \_\_\_\_\_.
- a) Gray code
  - b) XS-3 code
  - c) 8421 code
  - d) all of the above
- 12) A TTL circuit acts as a current source in the \_\_\_\_\_.
- a) low state
  - b) high state
  - c) high impedance state
  - d) none of these
- 13) A flip flop has \_\_\_\_\_ states.
- a) Four
  - b) One
  - c) Two
  - d) Three
- 14) The functional difference between S-R flip-flop and J-K flip flop is that \_\_\_\_\_.
- a) J-K flip-flop is faster than S-R flip-flop
  - b) J-K flip-flop has feedback path
  - c) J-K flip-flop accepts both inputs 1
  - d) J-K flip flop does not require external clock

Seat No.	
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Set **S**

**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10
- b) Design and implement full subtractor using a 4:1 multiplexer.
- c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS
- d) Derive a code table for BCD code 5421 which satisfies self complementary property.
- d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
- b) Design and implement 1:8 de-multiplexer using NAND gates only.
- c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

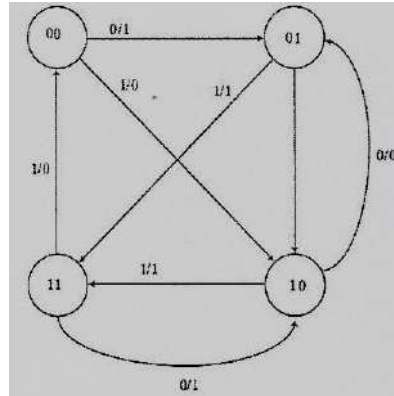
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
- b) Design a 3-bit ripple counter. What is the modulus of the counter?
- c) Design a D flip-flop using T flip-flop.
- d) Draw and explain a 4-bit twisted ring counter using shift register.
- e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.





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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) Figures to the right indicate full marks.  
 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 wavelength  $\lambda$ , frequency  $f$  and the velocity of light are related to each other by the relation, \_\_\_\_\_.
  - a)  $\lambda = f/c$
  - b)  $\lambda fc = 1$
  - c)  $\lambda f = c$
  - d)  $\lambda c = f$
- 2) Most of the power in an AM signal is in the \_\_\_\_\_.
  - a) Carrier
  - b) Upper sideband
  - c) Lower sideband
  - d) Modulating signal
- 3) Ceramic filters upper limit frequency is, \_\_\_\_\_.
  - a) 20hz
  - b) 20Khz
  - c) 200Khz
  - d) 20Mhz
- 4) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is, \_\_\_\_\_.
  - a) Unchanged
  - b) Half
  - c) Double
  - d) Increases by 50 Percent
- 5) In low level AM systems amplifiers following the modulated stages must be, \_\_\_\_\_.
  - a) Linear Devices
  - b) Harmonic devices
  - c) Class C amplifiers
  - d) Nonlinear devices
- 6) The Modulation Index is given by, \_\_\_\_\_.
  - a)  $M = E_m/E_c$
  - b)  $M = E_c/E_m$
  - c)  $M = 2E_c/E_m$
  - d)  $M = E_m/2$
- 7) A 400W carrier is modulated with a modulation Index of 75%. Calculate the DSBSC power, \_\_\_\_\_.
  - a) 113.6W
  - b) 112.5 W
  - c) 121.5W
  - d) 122.5W
- 8) If modulation signal frequency is doubled, then maximum frequency deviation is \_\_\_\_\_.
  - a) Double
  - b) Halved
  - c) Remains same
  - d) None of the above

- 9) In a FM system, if the modulation index is doubled by having the modulating frequency, what will be the effect on maximum deviation?
- |                      |                              |
|----------------------|------------------------------|
| a) no effect         | b) maximum deviation doubles |
| c) increases by 0.25 | d) decreases by 0.5          |
- 10) A pre-emphasis circuit is a \_\_\_\_\_.
- |                     |                     |
|---------------------|---------------------|
| a) Low pass filter  | b) Phase-shifter    |
| c) High pass filter | d) Band pass filter |
- 11) All broadcast radio signals received in daytime propagate by means of \_\_\_\_\_.
- |                       |                  |
|-----------------------|------------------|
| a) tropospheric waves | b) Troposcatter  |
| c) surface waves      | d) none of above |
- 12) The voice frequency in the telephone system is \_\_\_\_\_.
- |                 |                 |
|-----------------|-----------------|
| a) 20 Hz-20 kHz | b) 1kHz-10kHz   |
| c) 8kHz-80kHz   | d) 300Hz-3400Hz |
- 13) The frequency of busy tone in automatic exchanges \_\_\_\_\_.
- |           |                      |
|-----------|----------------------|
| a) 800 Hz | b) 400 Hz            |
| c) 133 Hz | d) None of the above |
- 14) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.
- |                           |                         |
|---------------------------|-------------------------|
| a) high frequency         | b) ultra high frequency |
| c) microwaves frequencies | d) optical frequencies  |

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

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

Max. Marks: 56

- 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 the following. (Any four) 16**

- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal.
- b) Explain the problems occurring in the TRF receivers.
- c) With suitable diagram and waveforms explain a diode demodulator.
- d) A carrier of 1000 kHz is simultaneously modulated by signals of 2 KHz 6 KHz & 2 KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power?
- e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?

**Q.3 Answer the following. (Any two) 12**

- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's.
- b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier.
- c) With suitable block diagram explain Superhetrodyne communication receiver.

**Section – II**

**Q.4 Answer the following. (Any four) 16**

- a) Compare narrowband and wideband FM.
- b) Explain in brief pulsed dialling and DTMF.
- c) Explain Sky wave propagation and its effects on various layers of ionosphere.
- d) Explain different types of noises and its effects.
- e) When the modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. What is the modulating index when the frequency is reduced to 250 Hz and the modulating voltage is simultaneously raised to 3.2 V?

**Q.5 Answer the following. (Any Two)**

- a)** Draw and explain the block diagram of Armstrong method of FM generation. Also draw the phasor diagram.
- b)** Explain the following:
  - 1) LOS propagation
  - 2) Basic antenna system
- c)** How crossbar switching is efficient than Strowger switching? Explain crossbar switching in detail.

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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) Figures to the right indicate full marks.  
 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) If modulation signal frequency is doubled, then maximum frequency deviation is \_\_\_\_\_.
  - a) Double
  - b) Halved
  - c) Remains same
  - d) None of the above
- 2) In a FM system, if the modulation index is doubled by having the modulating frequency, what will be the effect on maximum deviation?
  - a) no effect
  - b) maximum deviation doubles
  - c) increases by 0.25
  - d) decreases by 0.5
- 3) A pre-emphasis circuit is a \_\_\_\_\_.
  - a) Low pass filter
  - b) Phase-shifter
  - c) High pass filter
  - d) Band pass filter
- 4) All broadcast radio signals received in daytime propagate by means of \_\_\_\_\_.
  - a) tropospheric waves
  - b) Troposcatter
  - c) surface waves
  - d) none of above
- 5) The voice frequency in the telephone system is \_\_\_\_\_.
  - a) 20 Hz-20 kHz
  - b) 1kHz-10kHz
  - c) 8kHz-80kHz
  - d) 300Hz-3400Hz
- 6) The frequency of busy tone in automatic exchanges \_\_\_\_\_.
  - a) 800 Hz
  - b) 400 Hz
  - c) 133 Hz
  - d) None of the above
- 7) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.
  - a) high frequency
  - b) ultra high frequency
  - c) microwaves frequencies
  - d) optical frequencies
- 8) The wavelength  $\lambda$ , frequency  $f$  and the velocity of light are related to each other by the relation, \_\_\_\_\_.
  - a)  $\lambda = f/c$
  - b)  $\lambda fc = 1$
  - c)  $\lambda f = c$
  - d)  $\lambda c = f$
- 9) Most of the power in an AM signal is in the \_\_\_\_\_.
  - a) Carrier
  - b) Upper sideband
  - c) Lower sideband
  - d) Modulating signal



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

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

Max. Marks: 56

- 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 the following. (Any four) 16**

- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal.
- b) Explain the problems occurring in the TRF receivers.
- c) With suitable diagram and waveforms explain a diode demodulator.
- d) A carrier of 1000 kHz is simultaneously modulated by signals of 2 KHz 6 KHz & 2 KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power?
- e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?

**Q.3 Answer the following. (Any two) 12**

- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's.
- b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier.
- c) With suitable block diagram explain Superhetrodyne communication receiver.

**Section – II**

**Q.4 Answer the following. (Any four) 16**

- a) Compare narrowband and wideband FM.
- b) Explain in brief pulsed dialling and DTMF.
- c) Explain Sky wave propagation and its effects on various layers of ionosphere.
- d) Explain different types of noises and its effects.
- e) When the modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. What is the modulating index when the frequency is reduced to 250 Hz and the modulating voltage is simultaneously raised to 3.2 V?

**Q.5 Answer the following. (Any Two)**

- a)** Draw and explain the block diagram of Armstrong method of FM generation. Also draw the phasor diagram.
- b)** Explain the following:
  - 1) LOS propagation
  - 2) Basic antenna system
- c)** How crossbar switching is efficient than Strowger switching? Explain crossbar switching in detail.



Seat No.	
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) Figures to the right indicate full marks.  
 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 low level AM systems amplifiers following the modulated stages must be, \_\_\_\_\_.
 

a) Linear Devices	b) Harmonic devices
c) Class C amplifiers	d) Nonlinear devices
- 2) The Modulation Index is given by, \_\_\_\_\_.
 

a) $M = E_m/E_c$	b) $M = E_c/E_m$
c) $M = 2E_c/E_m$	d) $M = E_m/2$
- 3) A 400W carrier is modulated with a modulation Index of 75%. Calculate the DSBSC power, \_\_\_\_\_.
 

a) 113.6W	b) 112.5 W
c) 121.5W	d) 122.5W
- 4) If modulation signal frequency is doubled, then maximum frequency deviation is \_\_\_\_\_.
 

a) Double	b) Halved
c) Remains same	d) None of the above
- 5) In a FM system, if the modulation index is doubled by having the modulating frequency, what will be the effect on maximum deviation?
 

a) no effect	b) maximum deviation doubles
c) increases by 0.25	d) decreases by 0.5
- 6) A pre-emphasis circuit is a \_\_\_\_\_.
 

a) Low pass filter	b) Phase-shifter
c) High pass filter	d) Band pass filter
- 7) All broadcast radio signals received in daytime propagate by means of \_\_\_\_\_.
 

a) tropospheric waves	b) Troposcatter
c) surface waves	d) none of above
- 8) The voice frequency in the telephone system is \_\_\_\_\_.
 

a) 20 Hz-20 kHz	b) 1kHz-10kHz
c) 8kHz-80kHz	d) 300Hz-3400Hz
- 9) The frequency of busy tone in automatic exchanges \_\_\_\_\_.
 

a) 800 Hz	b) 400 Hz
c) 133 Hz	d) None of the above

- 10) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.  
a) high frequency                      b) ultra high frequency  
c) microwaves frequencies              d) optical frequencies
- 11) The wavelength  $\lambda$ , frequency  $f$  and the velocity of light are related to each other by the relation, \_\_\_\_\_.  
a)  $\lambda = f/c$                                   b)  $\lambda fc = 1$   
c)  $\lambda f = c$                                   d)  $\lambda c = f$
- 12) Most of the power in an AM signal is in the \_\_\_\_\_.  
a) Carrier                                      b) Upper sideband  
c) Lower sideband                              d) Modulating signal
- 13) Ceramic filters upper limit frequency is, \_\_\_\_\_.  
a) 20hz    b) 20Khz  
c) 200Khz                                        d) 20Mhz
- 14) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is, \_\_\_\_\_.  
a) Unchanged                                  b) Half  
c) Double                                        d) Increases by 50 Percent

Seat No.	
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 56

- 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 the following. (Any four) 16**

- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal.
- b) Explain the problems occurring in the TRF receivers.
- c) With suitable diagram and waveforms explain a diode demodulator.
- d) A carrier of 1000 kHz is simultaneously modulated by signals of 2 KHz 6 KHz & 2 KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power?
- e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?

**Q.3 Answer the following. (Any two) 12**

- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's.
- b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier.
- c) With suitable block diagram explain Superhetrodyne communication receiver.

**Section – II**

**Q.4 Answer the following. (Any four) 16**

- a) Compare narrowband and wideband FM.
- b) Explain in brief pulsed dialling and DTMF.
- c) Explain Sky wave propagation and its effects on various layers of ionosphere.
- d) Explain different types of noises and its effects.
- e) When the modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. What is the modulating index when the frequency is reduced to 250 Hz and the modulating voltage is simultaneously raised to 3.2 V?

**Q.5 Answer the following. (Any Two)**

- a)** Draw and explain the block diagram of Armstrong method of FM generation. Also draw the phasor diagram.
- b)** Explain the following:
  - 1) LOS propagation
  - 2) Basic antenna system
- c)** How crossbar switching is efficient than Strowger switching? Explain crossbar switching in detail.

Seat No.	
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**S.E. (Part – I) (New/Old) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) Figures to the right indicate full marks.  
 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) A pre-emphasis circuit is a \_\_\_\_\_.
  - a) Low pass filter
  - b) Phase-shifter
  - c) High pass filter
  - d) Band pass filter
- 2) All broadcast radio signals received in daytime propagate by means of \_\_\_\_\_.
  - a) tropospheric waves
  - b) Troposcatter
  - c) surface waves
  - d) none of above
- 3) The voice frequency in the telephone system is \_\_\_\_\_.
  - a) 20 Hz-20 kHz
  - b) 1kHz-10kHz
  - c) 8kHz-80kHz
  - d) 300Hz-3400Hz
- 4) The frequency of busy tone in automatic exchanges \_\_\_\_\_.
  - a) 800 Hz
  - b) 400 Hz
  - c) 133 Hz
  - d) None of the above
- 5) The ionosphere plays a significant role in radio wave propagation at \_\_\_\_\_.
  - a) high frequency
  - b) ultra high frequency
  - c) microwaves frequencies
  - d) optical frequencies
- 6) The wavelength  $\lambda$ , frequency  $f$  and the velocity of light are related to each other by the relation, \_\_\_\_\_.
  - a)  $\lambda = f/c$
  - b)  $\lambda fc = 1$
  - c)  $\lambda f = c$
  - d)  $\lambda c = f$
- 7) Most of the power in an AM signal is in the \_\_\_\_\_.
  - a) Carrier
  - b) Upper sideband
  - c) Lower sideband
  - d) Modulating signal
- 8) Ceramic filters upper limit frequency is, \_\_\_\_\_.
  - a) 20hz
  - b) 20Khz
  - c) 200Khz
  - d) 20Mhz
- 9) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is, \_\_\_\_\_.
  - a) Unchanged
  - b) Half
  - c) Double
  - d) Increases by 50 Percent

- 10) In low level AM systems amplifiers following the modulated stages must be, \_\_\_\_\_.
- |                       |                      |
|-----------------------|----------------------|
| a) Linear Devices     | b) Harmonic devices  |
| c) Class C amplifiers | d) Nonlinear devices |
- 11) The Modulation Index is given by, \_\_\_\_\_.
- |                   |                  |
|-------------------|------------------|
| a) $M = E_m/E_c$  | b) $M = E_c/E_m$ |
| c) $M = 2E_c/E_m$ | d) $M = E_m/2$   |
- 12) A 400W carrier is modulated with a modulation Index of 75%. Calculate the DSBSC power, \_\_\_\_\_.
- |           |            |
|-----------|------------|
| a) 113.6W | b) 112.5 W |
| c) 121.5W | d) 122.5W  |
- 13) If modulation signal frequency is doubled, then maximum frequency deviation is \_\_\_\_\_.
- |                 |                      |
|-----------------|----------------------|
| a) Double       | b) Halved            |
| c) Remains same | d) None of the above |
- 14) In a FM system, if the modulation index is doubled by having the modulating frequency, what will be the effect on maximum deviation?
- |                      |                              |
|----------------------|------------------------------|
| a) no effect         | b) maximum deviation doubles |
| c) increases by 0.25 | d) decreases by 0.5          |

Seat No.	
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Set **S**

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

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

Max. Marks: 56

- 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 the following. (Any four) 16**

- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal.
- b) Explain the problems occurring in the TRF receivers.
- c) With suitable diagram and waveforms explain a diode demodulator.
- d) A carrier of 1000 kHz is simultaneously modulated by signals of 2 KHz 6 KHz & 2 KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power?
- e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?

**Q.3 Answer the following. (Any two) 12**

- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's.
- b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier.
- c) With suitable block diagram explain Superhetrodyne communication receiver.

**Section – II**

**Q.4 Answer the following. (Any four) 16**

- a) Compare narrowband and wideband FM.
- b) Explain in brief pulsed dialling and DTMF.
- c) Explain Sky wave propagation and its effects on various layers of ionosphere.
- d) Explain different types of noises and its effects.
- e) When the modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. What is the modulating index when the frequency is reduced to 250 Hz and the modulating voltage is simultaneously raised to 3.2 V?

**Q.5 Answer the following. (Any Two)**

- a)** Draw and explain the block diagram of Armstrong method of FM generation. Also draw the phasor diagram.
- b)** Explain the following:
  - 1) LOS propagation
  - 2) Basic antenna system
- c)** How crossbar switching is efficient than Strowger switching? Explain crossbar switching in detail.



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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
2) 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 multistage amplifier employs four stages each of which has voltage gain of 40, then overall gain of amplifier is \_\_\_\_\_.
  - a) 128.16dB
  - b) 1281.6dB
  - c) 12.81dB
  - d) 1.28dB
- 2) Direct coupled amplifier is especially used for amplifying \_\_\_\_\_.
  - a) high frequency signal
  - b) very low frequency signal
  - c) dc signal
  - d) both b & c
- 3) Noise with feedback is \_\_\_\_\_.
 

<ol style="list-style-type: none"> <li>a) <math>N_f = \frac{N}{(1 + KAv)}</math></li> <li>c) <math>N_f = N(1 + KAv)</math></li> </ol>	<ol style="list-style-type: none"> <li>b) <math>N_f = \frac{(1 + KAv)}{N}</math></li> <li>d) <math>N_f = \frac{N}{(1 + KAvf)}</math></li> </ol>
---	---
- 4) The product of voltage gain & bandwidth of an amplifier with feedback & without feedback \_\_\_\_\_.
  - a) Greater than one
  - b) Less than one
  - c) remains same
  - d) none of the above
- 5) When current series feedback is applied to an amplifier, its output resistance is \_\_\_\_\_.
  - a) is decreased
  - b) is increased
  - c) remains same
  - d) None of the above
- 6) In CLASS A Power amplifier collector current in the output circuit flows for \_\_\_\_\_.
  - a) 180°
  - b) 360°
  - c) less than 180°
  - d) Greater than 180° & less than 360°
- 7) In CLASS B Power amplifier position of Q point is \_\_\_\_\_.
  - a) On X axis.
  - b) Exactly on center of the load line.
  - c) below X axis.
  - d) above X and below midpoint.

- 8) Which of the following circuits provides the highest frequency stability?  
 a) RC phase shift oscillator                      b) Colpitt's oscillator  
 c) Hartley oscillator                                      d) Crystal oscillator
- 9) In Wien bridge oscillator the frequency of oscillation will be \_\_\_\_\_.  
 a)  $\frac{1}{2\pi RC}$     b)  $\frac{1}{\pi RC}$   
 c)  $\frac{1}{\pi RC}$     d)  $\frac{1}{4\pi RC}$
- 10) The frequency of oscillation of an elementary LC oscillatory circuit depends on \_\_\_\_\_.  
 a) coil resistance                                      b) coil inductance  
 c) Capacitance                                      d) both b & c
- 11) In IC 555 pin 5 is \_\_\_\_\_.  
 a) Threshold                                      b) Discharge  
 c) control voltage                                      d)  $\frac{1}{3V_{CC}}$
- 12) For voltage to frequency conversion application \_\_\_\_\_ is used.  
 a) Monostable multivibrator                      b) Astable multivibrator  
 c) Schmitt trigger                                      d) Bistable multivibrator
- 13) Reference voltage for adjustable voltage regulator using LM 317 is \_\_\_\_\_.  
 a) 1.52 V                                      b) 0.125V  
 c) 1.25 V                                      d) None of above
- 14) The output voltage of LM337 as adjustable regulator is \_\_\_\_\_.  
 a)  $V_0 = V_{ref} \left( 1 + \frac{R_L}{R_1} \right) + I_{adj} \times R_L$                       b)  $V_0 = V_{ref} \left( 1 - \frac{R_L}{R_1} \right) + I_{adj} \times R_L$   
 c)  $V_0 = V_{ref} \left( 1 - \frac{R_L}{R_1} \right) - I_{adj} \times R_L$                       d)  $V_0 = V_{ref} \left( 1 + \frac{R_L}{R_1} \right) - I_{adj} \times R_L$

Seat  
No.

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

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.  
 4) Use of electronic component data sheet is allowed.

**Section – I**

**Q.2 Attempt any four.**

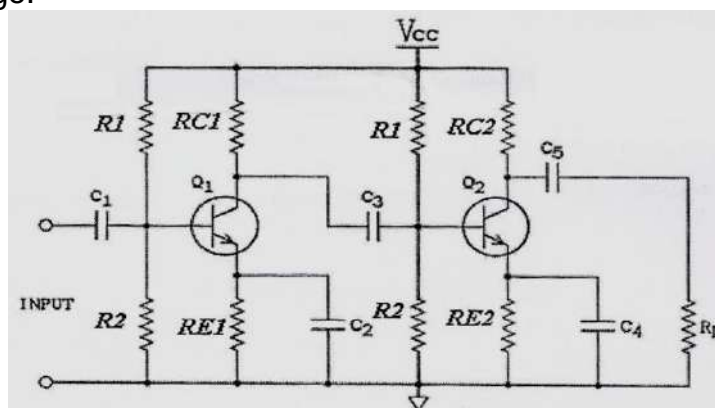
16

- What is multistage amplifier circuit? Show that the overall gain is the product of the gains of different stages.
- Derive an expression for voltage gain for direct coupled amplifier using AC equivalent circuit. Draw its frequency response characteristics.
- An amplifier with  $2K\Omega$  input resistance and  $60K\Omega$  output resistance has voltage gain of 40. The amplifier is modified to provide a 5% negative feedback in series with input. Calculate  $A_{vf}$ ,  $R_{if}$ ,  $R_{of}$
- Derive the expression for voltage gain and bandwidth for voltage series feedback circuit.
- Explain working of complementary symmetry Class B power amplifier. Sketch suitable waveforms.

**Q.3 Attempt any two.**

12

- A radio receiver uses a two stage RC coupled amplifier. Calculate value of voltage gain of each stage and overall voltage gain. If  $R_1=33K$ ,  $R_2=8.2K$ ,  $R_{C1}=3.3K$ ,  $R_{E1}=1K$ ,  $\beta_1=\beta_2=100$ ,  $R_L=10K$ ,  $V_{CC} = 20V$  use same value for second stage.



- Design a two stage RC coupled amplifier for overall gain with feedback 100 to meet the following specification  $R_L$ (load) =  $2k\Omega$ ,  $R_s = 100\Omega$ , output peak voltage = 5V,  $V_{CC} = 12V$ , lower 3db frequency = 50Hz, use BC147B.  $h_{fe} = 240$ ,  $h_{ie} = 4.5K\Omega$ .
- With graphical representation Compare different power amplifiers based on following factors:
  - Conduction angle
  - Position of Q point
  - Efficiency
  - Distortion
  - Application

## Section – II

- Q.4 Attempt any four.** **16**
- a) Sketch Schmitt trigger circuit using IC555 and briefly explain its operation giving input output waveform.
  - b) Design a Astable multivibrator using IC555 for maximum output frequency of 1KHz with duty cycle of 60%.Use  $V_{cc} = 12V$ .
  - c) Design adjustable voltage regulator for output voltage 9V to 25V and output current 1.0A. Assume  $I_{adj} = 100\mu A$
  - d) With suitable circuit diagram illustrate operation of short circuit protection circuit for IC voltage regulators.
  - e) With suitable circuit diagram derive an expression of frequency of oscillations for Hartley oscillator.
- Q.5 Attempt any two.** **12**
- a) Design Wien Bridge Oscillator for output frequency variations in range of 30Hz to 50KHz. The output voltage is better than 5V peak.
  - b) Draw internal circuit diagram of 555 based Monostable Multivibrator explain its operation and prove that pulse width =  $1.1 RC$
  - c) Explain working of transistorized series voltage regulator circuit and derive an expression for Stability Factor.

Seat  
No.

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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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) Which of the following circuits provides the highest frequency stability?
  - a) RC phase shift oscillator
  - b) Colpitt's oscillator
  - c) Hartley oscillator
  - d) Crystal oscillator
- 2) In Wien bridge oscillator the frequency of oscillation will be \_\_\_\_\_.
  - a)  $\frac{1}{2\pi RC}$
  - b)  $\frac{1}{\pi RC}$
  - c)  $\frac{2}{\pi RC}$
  - d)  $\frac{1}{4\pi RC}$
- 3) The frequency of oscillation of an elementary LC oscillatory circuit depends on \_\_\_\_\_.
  - a) coil resistance
  - b) coil inductance
  - c) Capacitance
  - d) both b & c
- 4) In IC 555 pin 5 is \_\_\_\_\_.
  - a) Threshold
  - b) Discharge
  - c) control voltage
  - d)  $\frac{1}{3V_{CC}}$
- 5) For voltage to frequency conversion application \_\_\_\_\_ is used.
  - a) Monostable multivibrator
  - b) Astable multivibrator
  - c) Schmitt trigger
  - d) Bistable multivibrator
- 6) Reference voltage for adjustable voltage regulator using LM 317 is \_\_\_\_\_.
  - a) 1.52 V
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- 8) A multistage amplifier employs four stages each of which has voltage gain of 40, then overall gain of amplifier is \_\_\_\_\_.  
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a) is decreased                          b) is increased  
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a)  $180^\circ$   
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c) less than  $180^\circ$   
d) Greater than  $180^\circ$  & less than  $360^\circ$
- 14) In CLASS B Power amplifier position of Q point is \_\_\_\_\_.  
a) On X axis.  
b) Exactly on center of the load line.  
c) below X axis.  
d) above X and below midpoint.

Seat  
No.

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

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data if necessary.  
 4) Use of electronic component data sheet is allowed.

**Section – I**

**Q.2 Attempt any four.**

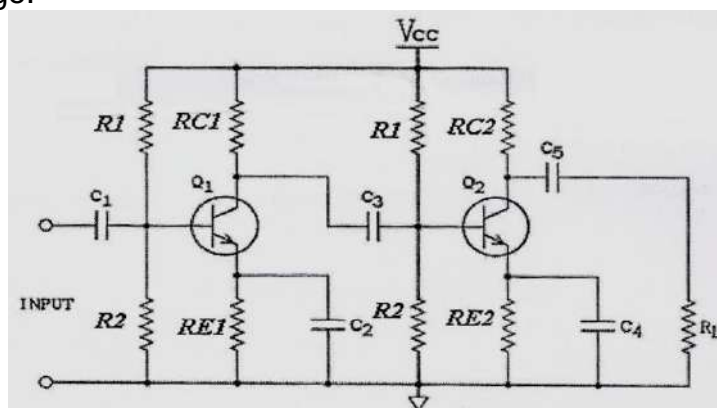
16

- What is multistage amplifier circuit? Show that the overall gain is the product of the gains of different stages.
- Derive an expression for voltage gain for direct coupled amplifier using AC equivalent circuit. Draw its frequency response characteristics.
- An amplifier with  $2K\Omega$  input resistance and  $60K\Omega$  output resistance has voltage gain of 40. The amplifier is modified to provide a 5% negative feedback in series with input. Calculate  $A_{vf}$ ,  $R_{if}$ ,  $R_{of}$
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**Q.3 Attempt any two.**

12

- A radio receiver uses a two stage RC coupled amplifier. Calculate value of voltage gain of each stage and overall voltage gain. If  $R_1=33K$ ,  $R_2=8.2K$ ,  $R_{C1}=3.3K$ ,  $R_{E1}=1K$ ,  $\beta_1=\beta_2=100$ ,  $R_L=10K$ ,  $V_{CC} = 20V$  use same value for second stage.



- Design a two stage RC coupled amplifier for overall gain with feedback 100 to meet the following specification  $R_L(\text{load}) = 2k\Omega$ ,  $R_s = 100\Omega$ , output peak voltage = 5V,  $V_{CC} = 12V$ , lower 3db frequency = 50Hz, use BC147B.  $h_{fe} = 240$ ,  $h_{ie} = 4.5K\Omega$ .
- With graphical representation Compare different power amplifiers based on following factors:
  - Conduction angle
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  - Efficiency
  - Distortion
  - Application

## Section – II

- Q.4 Attempt any four.** **16**
- a) Sketch Schmitt trigger circuit using IC555 and briefly explain its operation giving input output waveform.
  - b) Design a Astable multivibrator using IC555 for maximum output frequency of 1KHz with duty cycle of 60%.Use  $V_{cc} = 12V$ .
  - c) Design adjustable voltage regulator for output voltage 9V to 25V and output current 1.0A. Assume  $I_{adj} = 100\mu A$
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- a) Design Wien Bridge Oscillator for output frequency variations in range of 30Hz to 50KHz. The output voltage is better than 5V peak.
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Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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) When current series feedback is applied to an amplifier, its output resistance is \_\_\_\_\_.
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- 14) The product of voltage gain & bandwidth of an amplifier with feedback & without feedback \_\_\_\_\_.
- a) Greater than one  
b) Less than one  
c) remains same  
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Seat  
No.

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

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data if necessary.  
 4) Use of electronic component data sheet is allowed.

**Section – I**

**Q.2 Attempt any four.**

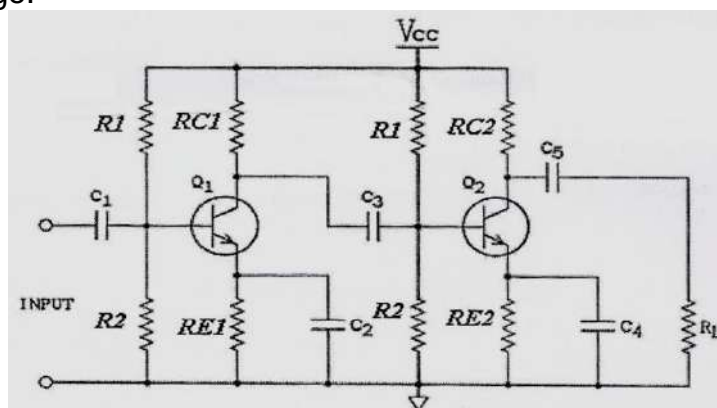
16

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- Derive the expression for voltage gain and bandwidth for voltage series feedback circuit.
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**Q.3 Attempt any two.**

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- A radio receiver uses a two stage RC coupled amplifier. Calculate value of voltage gain of each stage and overall voltage gain. If  $R_1=33K$ ,  $R_2=8.2K$ ,  $R_{C1}=3.3K$ ,  $R_{E1}=1K$ ,  $\beta_1=\beta_2=100$ ,  $R_L=10K$ ,  $V_{CC} = 20V$  use same value for second stage.



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- With graphical representation Compare different power amplifiers based on following factors:
  - Conduction angle
  - Position of Q point
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  - Application

## Section – II

- Q.4 Attempt any four.** **16**
- a) Sketch Schmitt trigger circuit using IC555 and briefly explain its operation giving input output waveform.
  - b) Design a Astable multivibrator using IC555 for maximum output frequency of 1KHz with duty cycle of 60%.Use  $V_{cc} = 12V$ .
  - c) Design adjustable voltage regulator for output voltage 9V to 25V and output current 1.0A. Assume  $I_{adj} = 100\mu A$
  - d) With suitable circuit diagram illustrate operation of short circuit protection circuit for IC voltage regulators.
  - e) With suitable circuit diagram derive an expression of frequency of oscillations for Hartley oscillator.
- Q.5 Attempt any two.** **12**
- a) Design Wien Bridge Oscillator for output frequency variations in range of 30Hz to 50KHz. The output voltage is better than 5V peak.
  - b) Draw internal circuit diagram of 555 based Monostable Multivibrator explain its operation and prove that pulse width =  $1.1 RC$
  - c) Explain working of transistorized series voltage regulator circuit and derive an expression for Stability Factor.

Seat No.	
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Set **S**

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

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

Max. Marks: 70

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

2) 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 frequency of oscillation of an elementary LC oscillatory circuit depends on \_\_\_\_\_.
  - a) coil resistance
  - b) coil inductance
  - c) Capacitance
  - d) both b & c
- 2) In IC 555 pin 5 is \_\_\_\_\_.
  - a) Threshold
  - b) Discharge
  - c) control voltage
  - d)  $\frac{1}{3V_{cc}}$
- 3) For voltage to frequency conversion application \_\_\_\_\_ is used.
  - a) Monostable multivibrator
  - b) Astable multivibrator
  - c) Schmitt trigger
  - d) Bistable multivibrator
- 4) Reference voltage for adjustable voltage regulator using LM 317 is \_\_\_\_\_.
  - a) 1.52 V
  - b) 0.125V
  - c) 1.25 V
  - d) None of above
- 5) The output voltage of LM337 as adjustable regulator is \_\_\_\_\_.
  - a)  $V_0 = V_{ref} \left(1 + \frac{R_L}{R1}\right) + I_{adj} \times R_L$
  - b)  $V_0 = V_{ref} \left(1 - \frac{R_L}{R1}\right) + I_{adj} \times R_L$
  - c)  $V_0 = V_{ref} \left(1 - \frac{R_L}{R1}\right) - I_{adj} \times R_L$
  - d)  $V_0 = V_{ref} \left(1 + \frac{R_L}{R1}\right) - I_{adj} \times R_L$
- 6) A multistage amplifier employs four stages each of which has voltage gain of 40, then overall gain of amplifier is \_\_\_\_\_.
  - a) 128.16dB
  - b) 1281.6dB
  - c) 12.81dB
  - d) 1.28dB
- 7) Direct coupled amplifier is especially used for amplifying \_\_\_\_\_.
  - a) high frequency signal
  - b) very low frequency signal
  - c) dc signal
  - d) both b & c
- 8) Noise with feedback is \_\_\_\_\_.
  - a)  $N_f = \frac{N}{(1 + KAv)}$
  - b)  $N_f = \frac{(1 + KAv)}{N}$
  - c)  $N_f = N(1 + KAv)$
  - d)  $N_f = \frac{N}{(1 + KAvf)}$

- 9) The product of voltage gain & bandwidth of an amplifier with feedback & without feedback \_\_\_\_\_.
- a) Greater than one                      b) Less than one  
c) remains same                          d) none of the above
- 10) When current series feedback is applied to an amplifier, its output resistance is \_\_\_\_\_.
- a) is decreased                              b) is increased  
c) remains same                          d) None of the above
- 11) In CLASS A Power amplifier collector current in the output circuit flows for \_\_\_\_\_.
- a)  $180^\circ$   
b)  $360^\circ$   
c) less than  $180^\circ$   
d) Greater than  $180^\circ$  & less than  $360^\circ$
- 12) In CLASS B Power amplifier position of Q point is \_\_\_\_\_.
- a) On X axis.  
b) Exactly on center of the load line.  
c) below X axis.  
d) above X and below midpoint.
- 13) Which of the following circuits provides the highest frequency stability?
- a) RC phase shift oscillator              b) Colpitt's oscillator  
c) Hartley oscillator                        d) Crystal oscillator
- 14) In wien bridge oscillator the frequency of oscillation will be \_\_\_\_\_.
- a)  $\frac{1}{2\pi RC}$                                       b)  $\frac{1}{\pi RC}$   
c)  $\frac{2}{\pi RC}$                                       d)  $\frac{1}{4\pi RC}$

Seat  
No.

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

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
 3) Assume suitable data if necessary.  
 4) Use of electronic component data sheet is allowed.

**Section – I**

**Q.2 Attempt any four.**

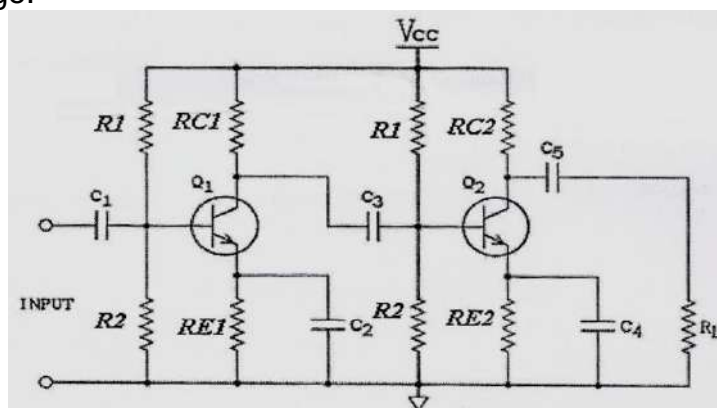
16

- What is multistage amplifier circuit? Show that the overall gain is the product of the gains of different stages.
- Derive an expression for voltage gain for direct coupled amplifier using AC equivalent circuit. Draw its frequency response characteristics.
- An amplifier with  $2K\Omega$  input resistance and  $60K\Omega$  output resistance has voltage gain of 40. The amplifier is modified to provide a 5% negative feedback in series with input. Calculate  $A_{vf}$ ,  $R_{if}$ ,  $R_{of}$
- Derive the expression for voltage gain and bandwidth for voltage series feedback circuit.
- Explain working of complementary symmetry Class B power amplifier. Sketch suitable waveforms.

**Q.3 Attempt any two.**

12

- A radio receiver uses a two stage RC coupled amplifier. Calculate value of voltage gain of each stage and overall voltage gain. If  $R_1=33K$ ,  $R_2=8.2K$ ,  $R_{C1}=3.3K$ ,  $R_{E1}=1K$ ,  $\beta_1=\beta_2=100$ ,  $R_L=10K$ ,  $V_{CC} = 20V$  use same value for second stage.



- Design a two stage RC coupled amplifier for overall gain with feedback 100 to meet the following specification  $R_L$ (load) =  $2k\Omega$ ,  $R_s = 100\Omega$ , output peak voltage = 5V,  $V_{CC} = 12V$ , lower 3db frequency = 50Hz, use BC147B.  $h_{fe} = 240$ ,  $h_{ie} = 4.5K\Omega$ .
- With graphical representation Compare different power amplifiers based on following factors:
  - Conduction angle
  - Position of Q point
  - Efficiency
  - Distortion
  - Application

## Section – II

- Q.4 Attempt any four.** **16**
- a) Sketch Schmitt trigger circuit using IC555 and briefly explain its operation giving input output waveform.
  - b) Design a Astable multivibrator using IC555 for maximum output frequency of 1KHz with duty cycle of 60%.Use  $V_{cc} = 12V$ .
  - c) Design adjustable voltage regulator for output voltage 9V to 25V and output current 1.0A. Assume  $I_{adj} = 100\mu A$
  - d) With suitable circuit diagram illustrate operation of short circuit protection circuit for IC voltage regulators.
  - e) With suitable circuit diagram derive an expression of frequency of oscillations for Hartley oscillator.
- Q.5 Attempt any two.** **12**
- a) Design Wien Bridge Oscillator for output frequency variations in range of 30Hz to 50KHz. The output voltage is better than 5V peak.
  - b) Draw internal circuit diagram of 555 based Monostable Multivibrator explain its operation and prove that pulse width =  $1.1 RC$
  - c) Explain working of transistorized series voltage regulator circuit and derive an expression for Stability Factor.



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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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 we delete an element in queue, which pointer is incremented?
  - a) Front
  - b) Rear
  - c) Both front and rear
  - d) None of the above
- 2) The node of singly linked list contains
  - a) Prev, info, next
  - b) Info, next
  - c) Both a and b
  - d) None of these
- 3) A normal queue, if implemented using an array of size MAX\_SIZE, gets full when
  - a)  $\text{Rear} = \text{MAX\_SIZE} - 1$
  - b)  $\text{Front} = (\text{rear} + 1) \bmod \text{MAX\_SIZE}$
  - c)  $\text{Front} = \text{rear} + 1$
  - d)  $\text{Rear} = \text{front}$
- 4) Consider the usual algorithm for determining whether a sequence of parentheses is balanced. The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes: (( ))(( ))(( )) are: \_\_\_\_\_.
  - a) 1
  - b) 2
  - c) 3
  - d) 4 or more
- 5) In the worst case, the number of comparisons needed to search a singly linked list of length n for a given element is \_\_\_\_\_.
  - a)  $\log 2n$
  - b)  $n/2$
  - c)  $\log 2n - 1$
  - d) n
- 6) To implement recursion \_\_\_\_\_ data structure is used
  - a) Queue
  - b) Stack
  - c) Linked List
  - d) Graph
- 7) Entries in a stack are "ordered". What is the meaning of this statement?
  - a) A collection of stacks is sortable
  - b) Stack entries may be compared with the '<' operation
  - c) The entries are stored in a linked list
  - d) There is a Sequential entry that is one by one

- 8) The complexity of linear search algorithm is \_\_\_\_\_.  
a)  $O(n)$                                       b)  $O(\log n)$   
c)  $O(n^2)$                                       d)  $O(n \log n)$
- 9) Quick sort is also known as \_\_\_\_\_.  
a) merge sort                                      b) tree sort  
c) shell sort                                      d) partition and exchange sort
- 10) The goal of hashing is to produce a search that takes \_\_\_\_\_.  
a)  $O(1)$                                       b)  $O(\log n)$   
c)  $O(n^2)$                                       d)  $O(n \log n)$
- 11) Which of the following traversal outputs the data in sorted order in a BST?  
a) In-order                                      b) Pre-order  
c) Post-order                                      d) None of these
- 12) If a node having two children is to be deleted from binary search tree, it is replaced by its \_\_\_\_\_.  
a) In-order predecessor                      b) In-order successor  
c) Pre-order predecessor                      d) None of these
- 13) An undirected graph contains the edges equal to \_\_\_\_\_.  
a)  $n/2$                                       b)  $n(n - 1)$   
c)  $n(n - 1)/2$                               d)  $n(n + 1)/2$
- 14) Breadth first traversal uses \_\_\_\_\_.  
a) Stack                                      b) Queue  
c) Both a and b                              d) None of these

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Set **P**

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Write a 'C' program to find the GCD of two numbers with recursive functions.
- b) What is stack? Explain the push operation with a 'C' routine.
- c) Elaborate the different operations performed on a queue with neat diagrams.
- d) What is avail list? Explain avail list in terms of getnode and freenode operations with algorithm and diagram.
- e) Convert the following infix expression to postfix expression using stack:  

$$(A + B)/(C - D) + E$$

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

- a) Write a C program for the implementation of stack using array containing push, pop and display functions.
- b) **Write short notes on:**
  - 1) Priority Queue
  - 2) Deque
- c) Write an algorithm for addition of two polynomials using linked list and illustrate the addition of two polynomials  $4x^2 + 3x + 2$  and  $6x^2 + 7x + 5$  using linked list.

**Section – II**

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

- a) Compare linear search and binary search.
- b) Sort the following using selection sort method  
30, 20, 35, 14, 90, 25, 32
- c) Define graph. Represent graph using adjacency matrix.
- d) Sort the given sequence in ascending order using quick sort.  
48, 44, 32, 22, 62, 95, 12, 56, 89
- e) Explain threaded binary tree with example.

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

- a) Construct a binary search tree from the following keys and find its in-order, pre-order and post-order traversal.  
70, 60, 55, 80, 85, 10, 3, 90, 82, 65, 79, 83, 52, 12, 17
- b) Explain graph traversal methods with example.
- c) What is hash collision? Explain open addressing technique in detail.

<b>Seat No.</b>	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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 complexity of linear search algorithm is \_\_\_\_\_.
 

a) $O(n)$	b) $O(\log n)$
c) $O(n^2)$	d) $O(n \log n)$
- 2) Quick sort is also known as \_\_\_\_\_.
 

a) merge sort	b) tree sort
c) shell sort	d) partition and exchange sort
- 3) The goal of hashing is to produce a search that takes \_\_\_\_\_.
 

a) $O(1)$	b) $O(\log n)$
c) $O(n^2)$	d) $O(n \log n)$
- 4) Which of the following traversal outputs the data in sorted order in a BST?
 

a) In-order	b) Pre-order
c) Post-order	d) None of these
- 5) If a node having two children is to be deleted from binary search tree, it is replaced by its \_\_\_\_\_.
 

a) In-order predecessor	b) In-order successor
c) Pre-order predecessor	d) None of these
- 6) An undirected graph contains the edges equal to \_\_\_\_\_.
 

a) $n/2$	b) $n(n - 1)$
c) $n(n - 1)/2$	d) $n(n + 1)/2$
- 7) Breadth first traversal uses \_\_\_\_\_.
 

a) Stack	b) Queue
c) Both a and b	d) None of these
- 8) When we delete an element in queue, which pointer is incremented?
 

a) Front	b) Rear
c) Both front and rear	d) None of the above
- 9) The node of singly linked list contains
 

a) Prev, info, next	b) Info, next
c) Both a and b	d) None of these

- 10) A normal queue, if implemented using an array of size MAX\_SIZE, gets full when
- a)  $\text{Rear} = \text{MAX\_SIZE} - 1$
  - b)  $\text{Front} = (\text{rear} + 1) \bmod \text{MAX\_SIZE}$
  - c)  $\text{Front} = \text{rear} + 1$
  - d)  $\text{Rear} = \text{front}$
- 11) Consider the usual algorithm for determining whether a sequence of parentheses is balanced. The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes:  $(( )(( ))(( )))$  are: \_\_\_\_\_.
- a) 1
  - b) 2
  - c) 3
  - d) 4 or more
- 12) In the worst case, the number of comparisons needed to search a singly linked list of length  $n$  for a given element is \_\_\_\_\_.
- a)  $\log 2n$
  - b)  $n/2$
  - c)  $\log 2n - 1$
  - d)  $n$
- 13) To implement recursion \_\_\_\_\_ data structure is used
- a) Queue
  - b) Stack
  - c) Linked List
  - d) Graph
- 14) Entries in a stack are "ordered". What is the meaning of this statement?
- a) A collection of stacks is sortable
  - b) Stack entries may be compared with the '<' operation
  - c) The entries are stored in a linked list
  - d) There is a Sequential entry that is one by one

Seat No.	
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Set **Q**

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Write a 'C' program to find the GCD of two numbers with recursive functions.
- b) What is stack? Explain the push operation with a 'C' routine.
- c) Elaborate the different operations performed on a queue with neat diagrams.
- d) What is avail list? Explain avail list in terms of getnode and freenode operations with algorithm and diagram.
- e) Convert the following infix expression to postfix expression using stack:  

$$(A + B)/(C - D) + E$$

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

- a) Write a C program for the implementation of stack using array containing push, pop and display functions.
- b) **Write short notes on:**
  - 1) Priority Queue
  - 2) Deque
- c) Write an algorithm for addition of two polynomials using linked list and illustrate the addition of two polynomials  $4x^2 + 3x + 2$  and  $6x^2 + 7x + 5$  using linked list.

**Section – II**

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

- a) Compare linear search and binary search.
- b) Sort the following using selection sort method  
30, 20, 35, 14, 90, 25, 32
- c) Define graph. Represent graph using adjacency matrix.
- d) Sort the given sequence in ascending order using quick sort.  
48, 44, 32, 22, 62, 95, 12, 56, 89
- e) Explain threaded binary tree with example.

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

- a) Construct a binary search tree from the following keys and find its in-order, pre-order and post-order traversal.  
70, 60, 55, 80, 85, 10, 3, 90, 82, 65, 79, 83, 52, 12, 17
- b) Explain graph traversal methods with example.
- c) What is hash collision? Explain open addressing technique in detail.

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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 the worst case, the number of comparisons needed to search a singly linked list of length  $n$  for a given element is \_\_\_\_\_.
  - a)  $\log 2n$
  - b)  $n/2$
  - c)  $\log 2n - 1$
  - d)  $n$
- 2) To implement recursion \_\_\_\_\_ data structure is used
  - a) Queue
  - b) Stack
  - c) Linked List
  - d) Graph
- 3) Entries in a stack are "ordered". What is the meaning of this statement?
  - a) A collection of stacks is sortable
  - b) Stack entries may be compared with the '<' operation
  - c) The entries are stored in a linked list
  - d) There is a Sequential entry that is one by one
- 4) The complexity of linear search algorithm is \_\_\_\_\_.
  - a)  $O(n)$
  - b)  $O(\log n)$
  - c)  $O(n^2)$
  - d)  $O(n \log n)$
- 5) Quick sort is also known as \_\_\_\_\_.
  - a) merge sort
  - b) tree sort
  - c) shell sort
  - d) partition and exchange sort
- 6) The goal of hashing is to produce a search that takes \_\_\_\_\_.
  - a)  $O(1)$
  - b)  $O(\log n)$
  - c)  $O(n^2)$
  - d)  $O(n \log n)$
- 7) Which of the following traversal outputs the data in sorted order in a BST?
  - a) In-order
  - b) Pre-order
  - c) Post-order
  - d) None of these
- 8) If a node having two children is to be deleted from binary search tree, it is replaced by its \_\_\_\_\_.
  - a) In-order predecessor
  - b) In-order successor
  - c) Pre-order predecessor
  - d) None of these





Seat No.	
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Set **R**

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Write a 'C' program to find the GCD of two numbers with recursive functions.
- b) What is stack? Explain the push operation with a 'C' routine.
- c) Elaborate the different operations performed on a queue with neat diagrams.
- d) What is avail list? Explain avail list in terms of getnode and freenode operations with algorithm and diagram.
- e) Convert the following infix expression to postfix expression using stack:  

$$(A + B)/(C - D) + E$$

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

- a) Write a C program for the implementation of stack using array containing push, pop and display functions.
- b) **Write short notes on:**
  - 1) Priority Queue
  - 2) Deque
- c) Write an algorithm for addition of two polynomials using linked list and illustrate the addition of two polynomials  $4x^2 + 3x + 2$  and  $6x^2 + 7x + 5$  using linked list.

**Section – II**

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

- a) Compare linear search and binary search.
- b) Sort the following using selection sort method  
30, 20, 35, 14, 90, 25, 32
- c) Define graph. Represent graph using adjacency matrix.
- d) Sort the given sequence in ascending order using quick sort.  
48, 44, 32, 22, 62, 95, 12, 56, 89
- e) Explain threaded binary tree with example.

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

- a) Construct a binary search tree from the following keys and find its in-order, pre-order and post-order traversal.  
70, 60, 55, 80, 85, 10, 3, 90, 82, 65, 79, 83, 52, 12, 17
- b) Explain graph traversal methods with example.
- c) What is hash collision? Explain open addressing technique in detail.

Seat No.	
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Set	S
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
 Electronics Engineering  
 DATA STRUCTURES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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 goal of hashing is to produce a search that takes \_\_\_\_\_.  
 a)  $O(1)$     b)  $O(\log n)$   
 c)  $O(n^2)$     d)  $O(n \log n)$
- 2) Which of the following traversal outputs the data in sorted order in a BST?  
 a) In-order    b) Pre-order  
 c) Post-order     d) None of these
- 3) If a node having two children is to be deleted from binary search tree, it is replaced by its \_\_\_\_\_.  
 a) In-order predecessor                              b) In-order successor  
 c) Pre-order predecessor                          d) None of these
- 4) An undirected graph contains the edges equal to \_\_\_\_\_.  
 a)  $n/2$      b)  $n(n - 1)$   
 c)  $n(n - 1)/2$     d)  $n(n + 1)/2$
- 5) Breadth first traversal uses \_\_\_\_\_.  
 a) Stack    b) Queue  
 c) Both a and b                                         d) None of these
- 6) When we delete an element in queue, which pointer is incremented?  
 a) Front    b) Rear  
 c) Both front and rear                               d) None of the above
- 7) The node of singly linked list contains  
 a) Prev, info, next                                    b) Info, next  
 c) Both a and b                                         d) None of these
- 8) A normal queue, if implemented using an array of size MAX\_SIZE, gets full when  
 a)  $Rear = MAX\_SIZE - 1$   
 b)  $Front = (rear + 1) \bmod MAX\_SIZE$   
 c)  $Front = rear + 1$   
 d)  $Rear = front$

- 9) Consider the usual algorithm for determining whether a sequence of parentheses is balanced. The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes:  $(( )(( ))(( )))$  are: \_\_\_\_\_.  
a) 1  
b) 2  
c) 3  
d) 4 or more
- 10) In the worst case, the number of comparisons needed to search a singly linked list of length  $n$  for a given element is \_\_\_\_\_.  
a)  $\log 2n$   
b)  $n/2$   
c)  $\log 2n - 1$   
d)  $n$
- 11) To implement recursion \_\_\_\_\_ data structure is used  
a) Queue  
b) Stack  
c) Linked List  
d) Graph
- 12) Entries in a stack are "ordered". What is the meaning of this statement?  
a) A collection of stacks is sortable  
b) Stack entries may be compared with the '<' operation  
c) The entries are stored in a linked list  
d) There is a Sequential entry that is one by one
- 13) The complexity of linear search algorithm is \_\_\_\_\_.  
a)  $O(n)$   
b)  $O(\log n)$   
c)  $O(n^2)$   
d)  $O(n \log n)$
- 14) Quick sort is also known as \_\_\_\_\_.  
a) merge sort  
b) tree sort  
c) shell sort  
d) partition and exchange sort

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Write a 'C' program to find the GCD of two numbers with recursive functions.
- b) What is stack? Explain the push operation with a 'C' routine.
- c) Elaborate the different operations performed on a queue with neat diagrams.
- d) What is avail list? Explain avail list in terms of getnode and freenode operations with algorithm and diagram.
- e) Convert the following infix expression to postfix expression using stack:  

$$(A + B)/(C - D) + E$$

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

- a) Write a C program for the implementation of stack using array containing push, pop and display functions.
- b) **Write short notes on:**
  - 1) Priority Queue
  - 2) Deque
- c) Write an algorithm for addition of two polynomials using linked list and illustrate the addition of two polynomials  $4x^2 + 3x + 2$  and  $6x^2 + 7x + 5$  using linked list.

**Section – II**

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

- a) Compare linear search and binary search.
- b) Sort the following using selection sort method  
30, 20, 35, 14, 90, 25, 32
- c) Define graph. Represent graph using adjacency matrix.
- d) Sort the given sequence in ascending order using quick sort.  
48, 44, 32, 22, 62, 95, 12, 56, 89
- e) Explain threaded binary tree with example.

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

- a) Construct a binary search tree from the following keys and find its in-order, pre-order and post-order traversal.  
70, 60, 55, 80, 85, 10, 3, 90, 82, 65, 79, 83, 52, 12, 17
- b) Explain graph traversal methods with example.
- c) What is hash collision? Explain open addressing technique in detail.

Seat  
No.

**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 3 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 a DC machine, rectification process is carried out in order to get unidirectional output (DC). This rectification process is carried out by \_\_\_\_\_.  
 a) Half wave rectifier                      b) Full wave rectifier  
 c) Mechanical rectification                d) Centre tapped rectifier
- 2) In normal dc machines operating at full-load conditions, the most powerful electromagnet is \_\_\_\_\_.  
 a) Field winding  
 b) Interpole Winding  
 c) Interpole and compensating winding together  
 d) Armature winding
- 3) When the supply frequency of a three phase induction motor is increased, then its synchronous speed is \_\_\_\_\_.  
 a) Decreases                                      b) Increases  
 c) remain same                                    d) none of the above
- 4) In induction motor the unit of slip is \_\_\_\_\_.  
 a) Rpm    b) Metre per second  
 c) Radian    d) Unit less
- 5) With the increase in supply voltage, the starting torque of a 3 phase induction motor \_\_\_\_\_.  
 a) Increases                                        b) Decrease  
 c) Remains same                                 d) None of the above
- 6) A capacitor start, capacitor run single phase induction motor is basically a \_\_\_\_\_.  
 a) Ac series motor                                b) Dc series motor  
 c) 2 phase induction motor                  d) 3 phase induction motor
- 7) A universal motor is one \_\_\_\_\_.  
 a) Which can run on any value of supply voltage  
 b) Which has infinitely varying speed  
 c) Which can operate on ac as well as dc voltage  
 d) Which can work as single phase or three phase motor
- 8) Open delta transformers can be obtained from \_\_\_\_\_.  
 a) Delta-delta                                      b) Star-delta  
 c) Delta-star                                        d) Any of the mentioned

- 9) For a 3-phase load balanced condition, each phase has the same value of \_\_\_\_\_.
- a) Impedance
  - b) Resistance
  - c) Power factor
  - d) All of these
- 10) The electric motor generally used in computer printer driver is \_\_\_\_\_.
- a) Reluctance motor
  - b) Hysteresis motor
  - c) Universal motor
  - d) Stepper motor
- 11) In a shaded pole motor, the rotating field is developed by using \_\_\_\_\_.
- a) Split phase
  - b) Shading coil
  - c) Inter-pole capacitor
  - d) A capacitor
- 12) In Case of three phase transformer 3 phase to 2 phase transformation is possible in \_\_\_\_\_ connection.
- a) Star-star
  - b) V-V
  - c) Delta-Delta
  - d) T-T
- 13) For dc shunt motor  $T \propto I_a$  because \_\_\_\_\_.
- a) The supply voltage is constant
  - b) Field winding current is constant
  - c) The speed is constant
  - d) The no load current is constant
- 14) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.
- a) Current in the conductor
  - b) Flux
  - c) Resultant force on conductor
  - d) None of the above

Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Discuss Characteristics of DC generator
- b) Calculate the speed of lap wound shunt motor which has 6 poles and 600 conductors. It draws a load current of 100 A from 120 V dc supply. Armature and shunt field resistances are 0.06 ohm and 30 ohm respectively. Flux per pole is 30 mwb.
- c) A shunt motor runs at 1000rpm, its armature taking 40A from 250V dc power supply. Calculate the resistance required in series with the armature circuit to decrease the speed to 600 rpm and to reduce armature current to 30A. Armature resistance is 0.5ohm.
- d) Why single phase induction motor is not self starting?
- e) Draw and explain the three point starter.
- f) Explain with diagram speed control methods for DC series motor.

**Q.3 Attempt Following** **12**

- a) Explain characteristics of DC motors.
- b) Discuss about the working, types, characteristics and applications of universal motor.
- c) Derive the emf equation for generator.

**Section – II**

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

- a) Explain concept of electric drive with block diagram.
- b) Draw neat diagram of star delta starter and explain its operation.
- c) A 12 pole 3 phase alternator is driven at speed of 600 rpm. It supplies power to a 6 pole 3 phase induction motor. Calculate the full load speed of the motor when the slip of the motor is 2.5%.
- d) Write the types of three phase transformer connections and explain any one in detail with diagram
- e) The watt meters in line R and Y a 120 volts, RYB system read 1500 watts and 500 watts respectively. Find the impedance and power factor of the balanced delta connected load.
- f) Discuss the power factor and causes of low power factor.

**Q.5 Attempt Following** **12**

- a) Write needs and methods of power factor improvement.
- b) Explain two wattmeter method for three phase power measurement
- c) A 11 KV 12 pole 50 Hz 3 phase star connected induction motor has a rotor resistance of 0.2 ohm respectively. Full load speed of the motor is 480rpm. Calculate
  - 1) Slip at maximum torque
  - 2) Ratio between maximum and full load torque
  - 3) Find the ratio of  $T_{max}$  and  $T_{sart}$

Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 3 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) Open delta transformers can be obtained from \_\_\_\_\_.
  - a) Delta-delta
  - b) Star-delta
  - c) Delta-star
  - d) Any of the mentioned
- 2) For a 3-phase load balanced condition, each phase has the same value of \_\_\_\_\_.
  - a) Impedance
  - b) Resistance
  - c) Power factor
  - d) All of these
- 3) The electric motor generally used in computer printer driver is \_\_\_\_\_.
  - a) Reluctance motor
  - b) Hysteresis motor
  - c) Universal motor
  - d) Stepper motor
- 4) In a shaded pole motor, the rotating field is developed by using \_\_\_\_\_.
  - a) Split phase
  - b) Shading coil
  - c) Inter-pole capacitor
  - d) A capacitor
- 5) In Case of three phase transformer 3 phase to 2 phase transformation is possible in \_\_\_\_\_ connection.
  - a) Star-star
  - b) V-V
  - c) Delta-Delta
  - d) T-T
- 6) For dc shunt motor  $T \propto I_a$  because \_\_\_\_\_.
  - a) The supply voltage is constant
  - b) Field winding current is constant
  - c) The speed is constant
  - d) The no load current is constant
- 7) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.
  - a) Current in the conductor
  - b) Flux
  - c) Resultant force on conductor
  - d) None of the above
- 8) In a DC machine, rectification process is carried out in order to get unidirectional output (DC). This rectification process is carried out by \_\_\_\_\_.
  - a) Half wave rectifier
  - b) Full wave rectifier
  - c) Mechanical rectification
  - d) Centre tapped rectifier



- 9) In normal dc machines operating at full-load conditions, the most powerful electromagnet is \_\_\_\_\_.
- a) Field winding
  - b) Interpole Winding
  - c) Interpole and compensating winding together
  - d) Armature winding
- 10) When the supply frequency of a three phase induction motor is increased, then its synchronous speed is \_\_\_\_\_.
- a) Decreases
  - b) Increases
  - c) remain same
  - d) none of the above
- 11) In induction motor the unit of slip is \_\_\_\_\_.
- a) Rpm
  - b) Metre per second
  - c) Radian
  - d) Unit less
- 12) With the increase in supply voltage, the starting torque of a 3 phase induction motor \_\_\_\_\_.
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  - b) Decrease
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- a) Ac series motor
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Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Discuss Characteristics of DC generator
- b) Calculate the speed of lap wound shunt motor which has 6 poles and 600 conductors. It draws a load current of 100 A from 120 V dc supply. Armature and shunt field resistances are 0.06 ohm and 30 ohm respectively. Flux per pole is 30 mwb.
- c) A shunt motor runs at 1000rpm, its armature taking 40A from 250V dc power supply. Calculate the resistance required in series with the armature circuit to decrease the speed to 600 rpm and to reduce armature current to 30A. Armature resistance is 0.5ohm.
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- e) Draw and explain the three point starter.
- f) Explain with diagram speed control methods for DC series motor.

**Q.3 Attempt Following** **12**

- a) Explain characteristics of DC motors.
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**Section – II**

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

- a) Explain concept of electric drive with block diagram.
- b) Draw neat diagram of star delta starter and explain its operation.
- c) A 12 pole 3 phase alternator is driven at speed of 600 rpm. It supplies power to a 6 pole 3 phase induction motor. Calculate the full load speed of the motor when the slip of the motor is 2.5%.
- d) Write the types of three phase transformer connections and explain any one in detail with diagram
- e) The watt meters in line R and Y a 120 volts, RYB system read 1500 watts and 500 watts respectively. Find the impedance and power factor of the balanced delta connected load.
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**Q.5 Attempt Following** **12**

- a) Write needs and methods of power factor improvement.
- b) Explain two wattmeter method for three phase power measurement
- c) A 11 KV 12 pole 50 Hz 3 phase star connected induction motor has a rotor resistance of 0.2 ohm respectively. Full load speed of the motor is 480rpm. Calculate
  - 1) Slip at maximum torque
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  - 3) Find the ratio of  $T_{max}$  and  $T_{sart}$

Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 3 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) With the increase in supply voltage, the starting torque of a 3 phase induction motor \_\_\_\_\_.
  - a) Increases
  - b) Decrease
  - c) Remains same
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  - a) Which can run on any value of supply voltage
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  - c) Delta-star
  - d) Any of the mentioned
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  - a) Impedance
  - b) Resistance
  - c) Power factor
  - d) All of these
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  - a) Reluctance motor
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  - b) Field winding current is constant
  - c) The speed is constant
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- 10) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.
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c) Resultant force on conductor                d) None of the above
- 11) In a DC machine, rectification process is carried out in order to get unidirectional output (DC). This rectification process is carried out by \_\_\_\_\_.
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c) Mechanical rectification                      d) Centre tapped rectifier
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- a) Decreases    b) Increases  
c) remain same    d) none of the above
- 14) In induction motor the unit of slip is \_\_\_\_\_.
- a) Rpm    b) Metre per second  
c) Radian    d) Unit less

Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Discuss Characteristics of DC generator
- b) Calculate the speed of lap wound shunt motor which has 6 poles and 600 conductors. It draws a load current of 100 A from 120 V dc supply. Armature and shunt field resistances are 0.06 ohm and 30 ohm respectively. Flux per pole is 30 mwb.
- c) A shunt motor runs at 1000rpm, its armature taking 40A from 250V dc power supply. Calculate the resistance required in series with the armature circuit to decrease the speed to 600 rpm and to reduce armature current to 30A. Armature resistance is 0.5ohm.
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- e) Draw and explain the three point starter.
- f) Explain with diagram speed control methods for DC series motor.

**Q.3 Attempt Following** **12**

- a) Explain characteristics of DC motors.
- b) Discuss about the working, types, characteristics and applications of universal motor.
- c) Derive the emf equation for generator.

**Section – II**

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

- a) Explain concept of electric drive with block diagram.
- b) Draw neat diagram of star delta starter and explain its operation.
- c) A 12 pole 3 phase alternator is driven at speed of 600 rpm. It supplies power to a 6 pole 3 phase induction motor. Calculate the full load speed of the motor when the slip of the motor is 2.5%.
- d) Write the types of three phase transformer connections and explain any one in detail with diagram
- e) The watt meters in line R and Y a 120 volts, RYB system read 1500 watts and 500 watts respectively. Find the impedance and power factor of the balanced delta connected load.
- f) Discuss the power factor and causes of low power factor.

**Q.5 Attempt Following** **12**

- a) Write needs and methods of power factor improvement.
- b) Explain two wattmeter method for three phase power measurement
- c) A 11 KV 12 pole 50 Hz 3 phase star connected induction motor has a rotor resistance of 0.2 ohm respectively. Full load speed of the motor is 480rpm. Calculate
  - 1) Slip at maximum torque
  - 2) Ratio between maximum and full load torque
  - 3) Find the ratio of  $T_{max}$  and  $T_{sart}$

Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 3 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 electric motor generally used in computer printer driver is \_\_\_\_\_.  
 a) Reluctance motor                                      b) Hysteresis motor  
 c) Universal motor    d) Stepper motor
- 2) In a shaded pole motor, the rotating field is developed by using \_\_\_\_\_.  
 a) Split phase    b) Shading coil  
 c) Inter-pole capacitor                                      d) A capacitor
- 3) In Case of three phase transformer 3 phase to 2 phase transformation is possible in \_\_\_\_\_ connection.  
 a) Star-star    b) V-V  
 c) Delta-Delta    d) T-T
- 4) For dc shunt motor  $T \propto I_a$  because \_\_\_\_\_.  
 a) The supply voltage is constant      b) Field winding current is constant  
 c) The speed is constant                      d) The no load current is constant
- 5) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.  
 a) Current in the conductor                      b) Flux  
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- 8) When the supply frequency of a three phase induction motor is increased, then its synchronous speed is \_\_\_\_\_.  
 a) Decreases    b) Increases  
 c) remain same    d) none of the above

- 9) In induction motor the unit of slip is \_\_\_\_\_.  
a) Rpm  
b) Metre per second  
c) Radian  
d) Unit less
- 10) With the increase in supply voltage, the starting torque of a 3 phase induction motor \_\_\_\_\_.  
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a) Which can run on any value of supply voltage  
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d) Which can work as single phase or three phase motor
- 13) Open delta transformers can be obtained from \_\_\_\_\_.  
a) Delta-delta  
b) Star-delta  
c) Delta-star  
d) Any of the mentioned
- 14) For a 3-phase load balanced condition, each phase has the same value of \_\_\_\_\_.  
a) Impedance  
b) Resistance  
c) Power factor  
d) All of these

Seat No.	
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**S.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 56

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

**Section – I**

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

- a) Discuss Characteristics of DC generator
- b) Calculate the speed of lap wound shunt motor which has 6 poles and 600 conductors. It draws a load current of 100 A from 120 V dc supply. Armature and shunt field resistances are 0.06 ohm and 30 ohm respectively. Flux per pole is 30 mwb.
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**Q.3 Attempt Following** **12**

- a) Explain characteristics of DC motors.
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**Section – II**

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

- a) Explain concept of electric drive with block diagram.
- b) Draw neat diagram of star delta starter and explain its operation.
- c) A 12 pole 3 phase alternator is driven at speed of 600 rpm. It supplies power to a 6 pole 3 phase induction motor. Calculate the full load speed of the motor when the slip of the motor is 2.5%.
- d) Write the types of three phase transformer connections and explain any one in detail with diagram
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- f) Discuss the power factor and causes of low power factor.

**Q.5 Attempt Following** **12**

- a) Write needs and methods of power factor improvement.
- b) Explain two wattmeter method for three phase power measurement
- c) A 11 KV 12 pole 50 Hz 3 phase star connected induction motor has a rotor resistance of 0.2 ohm respectively. Full load speed of the motor is 480rpm. Calculate
  - 1) Slip at maximum torque
  - 2) Ratio between maximum and full load torque
  - 3) Find the ratio of  $T_{max}$  and  $T_{sart}$



Seat  
No.

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 amplifying low level signals affected by noise \_\_\_\_\_ amplifier is used.
  - a) open loop with high gain
  - b) instrumentation
  - c) inverting
  - d) non inverting
- 2) Voltage follower is a special case of \_\_\_\_\_ amplifier.
  - a) inverting
  - b) non inverting
  - c) differential
  - d) instrumentation
- 3) Non identical transistors in the first stage of op amp results into \_\_\_\_\_.
  - a) input bias current
  - b) input offset current
  - c) thermal drift
  - d) all of these
- 4) In selecting op amp for high frequency application which of the below parameter is of more importance?
  - a) input bias current
  - b) CMRR
  - c) slew rate
  - d) open loop gain
- 5) An analog signal is converted into a discrete signal by \_\_\_\_\_.
  - a) ADC
  - b) sample and hold
  - c) integrator
  - d) anti aliasing filter
- 6) Op Amp is a \_\_\_\_\_ coupled \_\_\_\_\_ amplifier.
  - a) capacitor, high gain
  - b) directly, class AB
  - c) directly, high gain
  - d) capacitor, non linear
- 7) If we write,  $T = 2RC \ln\left(\frac{2R_1 + R_2}{R_2}\right)$ , we are talking about
  - a) square wave generator
  - b) third order low pass filter
  - c) second order high pass filter
  - d) no such circuit exists
- 8) Take odd man out: flash, R-2R, tracking, successive approximation.
  - a) flash
  - b) R-2R
  - c) tracking
  - d) successive approximation
- 9) For a first order low pass filter if  $f_H$  is 1 KHz, passband gain is 2 and  $C = 0.01 \mu F$ , value of R is \_\_\_\_\_  $\Omega$ .
  - a) 1.59 K
  - b) 1 K
  - c) 11.9 K
  - d) none of these

- 10) To achieve a stable circuit loop gain must be \_\_\_\_\_ when its magnitude reaches unity.
- |                             |                              |
|-----------------------------|------------------------------|
| a) greater than $0^\circ$   | b) greater than $-180^\circ$ |
| c) greater than $360^\circ$ | d) None of the above         |
- 11) Which of below is not a mode of PLL?
- |            |                 |
|------------|-----------------|
| a) capture | b) stable       |
| c) lock    | d) free running |
- 12) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR.
- |                         |                         |
|-------------------------|-------------------------|
| a) input offset current | b) input offset voltage |
| c) thermal drift        | d) CMRR                 |
- 13) Bode plot is used for \_\_\_\_\_.
- |                      |                               |
|----------------------|-------------------------------|
| a) Feedback analysis | b) thermal drift calculations |
| c) CMRR calculations | d) Stability analysis         |
- 14) Output offset voltage changes with \_\_\_\_\_.
- |                   |                 |
|-------------------|-----------------|
| a) temperature    | b) time         |
| c) supply voltage | d) all of these |

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any two.** **12**
- How a differential amplifier can be designed using two op amps? Also derive for its output.
  - Derive for resistor values of offset voltage compensation network, for an open loop op amp.
  - Derive for an output of a differentiator. What are its limitations?
- Q.3 Solve any four** **16**
- For an inverting amplifier with  $R_1 = 470\Omega$  &  $R_f = 4.7\text{ K}\Omega$ . Calculate voltage gain, input resistance, output resistance and bandwidth after feedback. Op Amp is 741 with open loop gain = 200,000, break frequency = 5 Hz, input resistance = 2 M $\Omega$  and output resistance = 75  $\Omega$ .
  - Design:
    - A non inverting amplifier with gain 1
    - An inverting amplifier with gain 10
  - What is thermal drift? How it affects op amp performance?
  - Derive for output resistance of a non inverting amplifier with feedback.
  - Comment - instrumentation amplifier is used for measurement of physical quantities.

**Section – II**

- Q.4 Solve any two** **12**
- With suitable diagram analyze working of weighted resistor DAC. What are its limitations?
  - Analyze square wave generator using op amp. Derive for its frequency.
  - Analyze negative clipper. How it can be converted into a half wave rectifier?
- Q.5 Solve any four** **16**
- Analyze any one application of PLL
  - Discuss flash ADC
  - Show how a peak detector can be designed using op amp
  - Draw and explain narrow band pass filter
  - Explain any two significant DAC specifications

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Take odd man out: flash, R-2R, tracking, successive approximation.
  - a) flash
  - b) R-2R
  - c) tracking
  - d) successive approximation
- 2) For a first order low pass filter if  $f_H$  is 1 KHz, passband gain is 2 and  $C = 0.01 \mu\text{F}$ , value of R is \_\_\_\_\_  $\Omega$ .
  - a) 1.59 K
  - b) 1 K
  - c) 11.9 K
  - d) none of these
- 3) To achieve a stable circuit loop gain must be \_\_\_\_\_ when its magnitude reaches unity.
  - a) greater than  $0^\circ$
  - b) greater than  $-180^\circ$
  - c) greater than  $360^\circ$
  - d) None of the above
- 4) Which of below is not a mode of PLL?
  - a) capture
  - b) stable
  - c) lock
  - d) free running
- 5) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR.
  - a) input offset current
  - b) input offset voltage
  - c) thermal drift
  - d) CMRR
- 6) Bode plot is used for \_\_\_\_\_.
  - a) Feedback analysis
  - b) thermal drift calculations
  - c) CMRR calculations
  - d) Stability analysis
- 7) Output offset voltage changes with \_\_\_\_\_.
  - a) temperature
  - b) time
  - c) supply voltage
  - d) all of these
- 8) For amplifying low level signals affected by noise \_\_\_\_\_ amplifier is used.
  - a) open loop with high gain
  - b) instrumentation
  - c) inverting
  - d) non inverting
- 9) Voltage follower is a special case of \_\_\_\_\_ amplifier.
  - a) inverting
  - b) non inverting
  - c) differential
  - d) instrumentation

- 10) Non identical transistors in the first stage of op amp results into \_\_\_\_\_.
- a) input bias current                      b) input offset current  
c) thermal drift                              d) all of these
- 11) In selecting op amp for high frequency application which of the below parameter is of more importance?
- a) input bias current                      b) CMRR  
c) slew rate                                  d) open loop gain
- 12) An analog signal is converted into a discrete signal by \_\_\_\_\_.
- a) ADC    b) sample and hold  
c) integrator                                  d) anti aliasing filter
- 13) Op Amp is a \_\_\_\_\_ coupled \_\_\_\_\_ amplifier.
- a) capacitor, high gain                      b) directly, class AB  
c) directly, high gain                        d) capacitor, non linear
- 14) If we write,  $T = 2RC \ln\left(\frac{2R_1 + R_2}{R_2}\right)$ , we are talking about
- a) square wave generator                      b) third order low pass filter  
c) second order high pass filter              d) no such circuit exists

Seat No.	
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Set **Q**

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any two.** **12**
- How a differential amplifier can be designed using two op amps? Also derive for its output.
  - Derive for resistor values of offset voltage compensation network, for an open loop op amp.
  - Derive for an output of a differentiator. What are its limitations?
- Q.3 Solve any four** **16**
- For an inverting amplifier with  $R_1 = 470\Omega$  &  $R_f = 4.7\text{ K}\Omega$ . Calculate voltage gain, input resistance, output resistance and bandwidth after feedback. Op Amp is 741 with open loop gain = 200,000, break frequency = 5 Hz, input resistance = 2 M $\Omega$  and output resistance = 75  $\Omega$ .
  - Design:
    - A non inverting amplifier with gain 1
    - An inverting amplifier with gain 10
  - What is thermal drift? How it affects op amp performance?
  - Derive for output resistance of a non inverting amplifier with feedback.
  - Comment - instrumentation amplifier is used for measurement of physical quantities.

**Section – II**

- Q.4 Solve any two** **12**
- With suitable diagram analyze working of weighted resistor DAC. What are its limitations?
  - Analyze square wave generator using op amp. Derive for its frequency.
  - Analyze negative clipper. How it can be converted into a half wave rectifier?
- Q.5 Solve any four** **16**
- Analyze any one application of PLL
  - Discuss flash ADC
  - Show how a peak detector can be designed using op amp
  - Draw and explain narrow band pass filter
  - Explain any two significant DAC specifications

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) An analog signal is converted into a discrete signal by \_\_\_\_\_.  
 a) ADC  
 b) sample and hold  
 c) integrator  
 d) anti aliasing filter
- 2) Op Amp is a \_\_\_\_\_ coupled \_\_\_\_\_ amplifier.  
 a) capacitor, high gain  
 b) directly, class AB  
 c) directly, high gain  
 d) capacitor, non linear
- 3) If we write,  $T = 2RC \ln\left(\frac{2R_1 + R_2}{R_2}\right)$ , we are talking about  
 a) square wave generator  
 b) third order low pass filter  
 c) second order high pass filter  
 d) no such circuit exists
- 4) Take odd man out: flash, R-2R, tracking, successive approximation.  
 a) flash  
 b) R-2R  
 c) tracking  
 d) successive approximation
- 5) For a first order low pass filter if  $f_H$  is 1 KHz, passband gain is 2 and  $C = 0.01 \mu F$ , value of R is \_\_\_\_\_  $\Omega$ .  
 a) 1.59 K  
 b) 1 K  
 c) 11.9 K  
 d) none of these
- 6) To achieve a stable circuit loop gain must be \_\_\_\_\_ when its magnitude reaches unity.  
 a) greater than  $0^\circ$   
 b) greater than  $-180^\circ$   
 c) greater than  $360^\circ$   
 d) None of the above
- 7) Which of below is not a mode of PLL?  
 a) capture  
 b) stable  
 c) lock  
 d) free running
- 8) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR.  
 a) input offset current  
 b) input offset voltage  
 c) thermal drift  
 d) CMRR

- 9) Bode plot is used for \_\_\_\_\_.
- a) Feedback analysis
  - b) thermal drift calculations
  - c) CMRR calculations
  - d) Stability analysis
- 10) Output offset voltage changes with \_\_\_\_\_.
- a) temperature
  - b) time
  - c) supply voltage
  - d) all of these
- 11) For amplifying low level signals affected by noise \_\_\_\_\_ amplifier is used.
- a) open loop with high gain
  - b) instrumentation
  - c) inverting
  - d) non inverting
- 12) Voltage follower is a special case of \_\_\_\_\_ amplifier.
- a) inverting
  - b) non inverting
  - c) differential
  - d) instrumentation
- 13) Non identical transistors in the first stage of op amp results into \_\_\_\_\_.
- a) input bias current
  - b) input offset current
  - c) thermal drift
  - d) all of these
- 14) In selecting op amp for high frequency application which of the below parameter is of more importance?
- a) input bias current
  - b) CMRR
  - c) slew rate
  - d) open loop gain



Seat No.	
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Set **R**

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any two.** **12**
- a) How a differential amplifier can be designed using two op amps? Also derive for its output.
  - b) Derive for resistor values of offset voltage compensation network, for an open loop op amp.
  - c) Derive for an output of a differentiator. What are its limitations?
- Q.3 Solve any four** **16**
- a) For an inverting amplifier with  $R_1 = 470\Omega$  &  $R_f = 4.7\text{ K}\Omega$ . Calculate voltage gain, input resistance, output resistance and bandwidth after feedback. Op Amp is 741 with open loop gain = 200,000, break frequency = 5 Hz, input resistance = 2 M $\Omega$  and output resistance = 75  $\Omega$ .
  - b) Design:
    - 1) A non inverting amplifier with gain 1
    - 2) An inverting amplifier with gain 10
  - c) What is thermal drift? How it affects op amp performance?
  - d) Derive for output resistance of a non inverting amplifier with feedback.
  - e) Comment - instrumentation amplifier is used for measurement of physical quantities.

**Section – II**

- Q.4 Solve any two** **12**
- a) With suitable diagram analyze working of weighted resistor DAC. What are its limitations?
  - b) Analyze square wave generator using op amp. Derive for its frequency.
  - c) Analyze negative clipper. How it can be converted into a half wave rectifier?
- Q.5 Solve any four** **16**
- a) Analyze any one application of PLL
  - b) Discuss flash ADC
  - c) Show how a peak detector can be designed using op amp
  - d) Draw and explain narrow band pass filter
  - e) Explain any two significant DAC specifications

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 achieve a stable circuit loop gain must be \_\_\_\_\_ when its magnitude reaches unity.
 

a) greater than $0^\circ$	b) greater than $-180^\circ$
c) greater than $360^\circ$	d) None of the above
- 2) Which of below is not a mode of PLL?
 

a) capture	b) stable
c) lock	d) free running
- 3) Make odd man out: input offset current, input offset voltage, thermal drift, CMRR.
 

a) input offset current	b) input offset voltage
c) thermal drift	d) CMRR
- 4) Bode plot is used for \_\_\_\_\_.
 

a) Feedback analysis	b) thermal drift calculations
c) CMRR calculations	d) Stability analysis
- 5) Output offset voltage changes with \_\_\_\_\_.
 

a) temperature	b) time
c) supply voltage	d) all of these
- 6) For amplifying low level signals affected by noise \_\_\_\_\_ amplifier is used.
 

a) open loop with high gain	b) instrumentation
c) inverting	d) non inverting
- 7) Voltage follower is a special case of \_\_\_\_\_ amplifier.
 

a) inverting	b) non inverting
c) differential	d) instrumentation
- 8) Non identical transistors in the first stage of op amp results into \_\_\_\_\_.
 

a) input bias current	b) input offset current
c) thermal drift	d) all of these
- 9) In selecting op amp for high frequency application which of the below parameter is of more importance?
 

a) input bias current	b) CMRR
c) slew rate	d) open loop gain

- 10) An analog signal is converted into a discrete signal by \_\_\_\_\_.
- a) ADC
  - b) sample and hold
  - c) integrator
  - d) anti aliasing filter
- 11) Op Amp is a \_\_\_\_\_ coupled \_\_\_\_\_ amplifier.
- a) capacitor, high gain
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- a) square wave generator
  - b) third order low pass filter
  - c) second order high pass filter
  - d) no such circuit exists
- 13) Take odd man out: flash, R-2R, tracking, successive approximation.
- a) flash
  - b) R-2R
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- 14) For a first order low pass filter if  $f_H$  is 1 KHz, passband gain is 2 and  $C = 0.01 \mu F$ , value of R is \_\_\_\_\_  $\Omega$ .
- a) 1.59 K
  - b) 1 K
  - c) 11.9 K
  - d) none of these

Seat No.	
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Set **S**

**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any two.** **12**
- a) How a differential amplifier can be designed using two op amps? Also derive for its output.
  - b) Derive for resistor values of offset voltage compensation network, for an open loop op amp.
  - c) Derive for an output of a differentiator. What are its limitations?
- Q.3 Solve any four** **16**
- a) For an inverting amplifier with  $R_1 = 470\Omega$  &  $R_f = 4.7\text{ K}\Omega$ . Calculate voltage gain, input resistance, output resistance and bandwidth after feedback. Op Amp is 741 with open loop gain = 200,000, break frequency = 5 Hz, input resistance = 2 M $\Omega$  and output resistance = 75  $\Omega$ .
  - b) Design:
    - 1) A non inverting amplifier with gain 1
    - 2) An inverting amplifier with gain 10
  - c) What is thermal drift? How it affects op amp performance?
  - d) Derive for output resistance of a non inverting amplifier with feedback.
  - e) Comment - instrumentation amplifier is used for measurement of physical quantities.

**Section – II**

- Q.4 Solve any two** **12**
- a) With suitable diagram analyze working of weighted resistor DAC. What are its limitations?
  - b) Analyze square wave generator using op amp. Derive for its frequency.
  - c) Analyze negative clipper. How it can be converted into a half wave rectifier?
- Q.5 Solve any four** **16**
- a) Analyze any one application of PLL
  - b) Discuss flash ADC
  - c) Show how a peak detector can be designed using op amp
  - d) Draw and explain narrow band pass filter
  - e) Explain any two significant DAC specifications

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Does the system  $h(t) = \exp(-7t) u(t)$  correspond to a stable system?
  - a) Yes
  - b) No
  - c) Marginally Stable
  - d) Cant determine
- 2) Find the value of  $h[n] * \delta [n - 1]$ ,  $\delta[n]$  being the delta function.
  - a)  $h[n - 2]$
  - b)  $h[n]$
  - c)  $h[n - 1]$
  - d)  $h[n + 1]$
- 3) The type of systems which are characterized by input and the output quantized at certain levels are called as \_\_\_\_\_.
  - a) analog
  - b) discrete
  - c) continuous
  - d) digital
- 4)  $x(t)$  or  $x(n)$  is defined to be an energy signal, if and only if the total energy content of the signal is a: \_\_\_\_\_.
  - a) Finite quantity
  - b) Zero
  - c) Infinite quantity
  - d) Unity
- 5)  $m(t)$  is an even function, then its Fourier representation has \_\_\_\_\_.
  - a)  $a_0 = 0$
  - b)  $a_n = 0$
  - c)  $b_n = 0$
  - d)  $a_n = b_n$
- 6) Foureier series applies to \_\_\_\_\_.
  - a) Only Periodic signals
  - b) Only aperiodic signals
  - c) Both periodic and aperiodic signals
  - d) Only random signals
- 7) A system which is linear is said to obey the rules of \_\_\_\_\_.
  - a) scaling
  - b) additivity
  - c) shifting and scaling
  - d) both scaling and additivity
- 8) According to property of ZT "ROC cannot contain \_\_\_\_\_.
  - a) Zeros
  - b) Poles
  - c) Both Poles and Zeros
  - d) None
- 9) Fourier transform of  $\delta(t)$  is \_\_\_\_\_.
  - a)  $\delta(\omega)$
  - b)  $2\pi\delta(\omega)$
  - c) 1
  - d) can't define

- 10) When the system has poles inside the unit circle in Z-domain \_\_\_\_\_.
- a) The system is stable and its impulse response is a decaying function
  - b) Time domain behavior will be exponentially increasing signal
  - c) The system is unstable
  - d) The impulse response is marginally constant
- 11) A signal  $x(t)$  has a Fourier transform  $X(j\omega)$ . If  $x(t)$  is a real and odd function of  $t$ , then  $X(j\omega)$  is \_\_\_\_\_.
- a) A real and even function of  $\omega$
  - b) Purely imaginary and odd function of  $\omega$
  - c) An imaginary and even function of  $\omega$
  - d) A real and odd function of  $\omega$
- 12) What does the spectral density function of any signal specify?
- a) Distribution of energy or power
  - b) Consumption of energy or power
  - c) Conservation of energy or power
  - d) Generation of energy or power
- 13) The autocorrelation function is \_\_\_\_\_.
- a) Even
  - b) Odd
  - c) Both
  - d) None of these
- 14) Which of the following is the method used for reconstruction of signal from its samples?
- a) Zero order hold
  - b) Linear interpolation
  - c) Both a) and b)
  - d) None of these

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions compulsory.  
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 3) Assume suitable data if necessary.

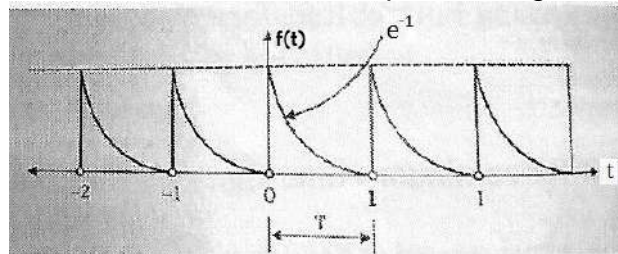
**Section – I**

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

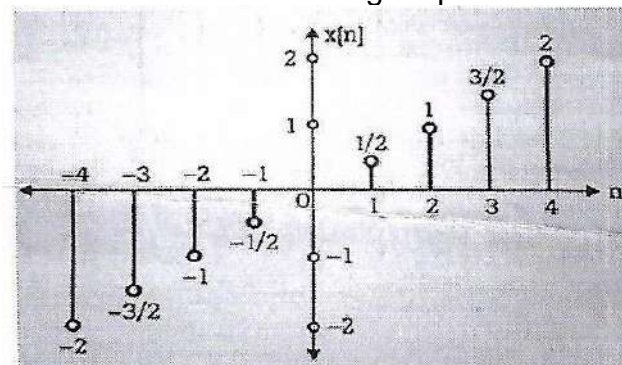
- a) Verify following properties for the system  $y(t) = x(t + 2)$ .
- 1) Static/Dynamic
  - 2) Causality
  - 3) Time Variance
- b) Find even and odd parts of the signal  
 $x[n] = 1; -2 \leq n \leq 2$
- c) Check following signal periodicity. If periodic, find the fundamental time period.  
 $x(t) = 2 \cos(3t) + 3 \sin(7t)$
- d) Explain Dirichlet's conditions.

**Q.3 Attempt any two of the following.** **16**

- a) Find the exponential Fourier series for the periodic signal  $x(t)$ .



- b) Refer the sketch below and draw following sequences:



- 1)  $x[-n] u[n] + x[n]$
  - 2)  $x[n + 2] + x[1 - n]$
- c) Convolve the following signals:  
 $X(t) = e^{-2t} \cdot u(t)$  and  $h(t) = u(t + 2)$

## Section – II

**Q.4 Attempt any four of the following.**

16

- a) Obtain the Fourier transform of  $x(t) = e^{-3t} u(t)$ . Sketch Magnitude spectrum.
- b) Define Spectral density & state its properties.
- c) A discrete time LTI system is given by the transfer function.

$$H(z) = \frac{3 - 4z^{-1}}{1 - 3.5z^{-1} + 1.5z^{-2}}$$

Specify the ROC of  $H(z)$  and determine impulse response  $h[n]$  if the system is stable.

- d) The analog signal  $x(t)$  is given below.

$$x(t) = 5 \sin(150\pi t) + 6 \cos(1400\pi t) - \sin(350\pi t)$$

Calculate the Nyquist sampling rate for the signal.

- e) Explain how to represent periodic signal using Fourier transform?

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

12

- a) State and explain the sampling theorem for continuous time signals.
- b) Compute Fourier transform of following signals. Sketch magnitude transforms.

1)  $x_1(t) = e^{-3(t-2)} u(t-2)$

2)  $x(t) = \delta(t-3)$

- c) State

1) Time Shifting.

2) Differentiation Properties of Fourier transform

Determine time domain signal  $x(t)$  whose Fourier transform  $X(j\omega)$  is as below.

$$X(j\omega) = \begin{cases} 3 & \text{for } -1 \leq \omega \leq 1 \\ 0 & \text{otherwise} \end{cases}$$



Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) According to property of ZT “ROC cannot contain \_\_\_\_\_”.
  - a) Zeros
  - b) Poles
  - c) Both Poles and Zeros
  - d) None
- 2) Fourier transform of  $\delta(t)$  is \_\_\_\_\_.
  - a)  $\delta(\omega)$
  - b)  $2\pi\delta(\omega)$
  - c) 1
  - d) can't define
- 3) When the system has poles inside the unit circle in Z-domain \_\_\_\_\_.
  - a) The system is stable and its impulse response is a decaying function
  - b) Time domain behavior will be exponentially increasing signal
  - c) The system is unstable
  - d) The impulse response is marginally constant
- 4) A signal  $x(t)$  has a Fourier transform  $X(j\omega)$ . If  $x(t)$  is a real and odd function of  $t$ , then  $X(j\omega)$  is \_\_\_\_\_.
  - a) A real and even function of  $\omega$
  - b) Purely imaginary and odd function of  $\omega$
  - c) An imaginary and even function of  $\omega$
  - d) A real and odd function of  $\omega$
- 5) What does the spectral density function of any signal specify?
  - a) Distribution of energy or power
  - b) Consumption of energy or power
  - c) Conservation of energy or power
  - d) Generation of energy or power
- 6) The autocorrelation function is \_\_\_\_\_.
  - a) Even
  - b) Odd
  - c) Both
  - d) None of these
- 7) Which of the following is the method used for reconstruction of signal from its samples?
  - a) Zero order hold
  - b) Linear interpolation
  - c) Both a) and b)
  - d) None of these
- 8) Does the system  $h(t) = \exp(-7t) u(t)$  correspond to a stable system?
  - a) Yes
  - b) No
  - c) Marginally Stable
  - d) Cant determine

- 9) Find the value of  $h[n] * \delta[n - 1]$ ,  $\delta[n]$  being the delta function.  
a)  $h[n - 2]$     b)  $h[n]$   
c)  $h[n - 1]$     d)  $h[n + 1]$
- 10) The type of systems which are characterized by input and the output quantized at certain levels are called as \_\_\_\_\_.  
a) analog    b) discrete  
c) continuous    d) digital
- 11)  $x(t)$  or  $x(n)$  is defined to be an energy signal, if and only if the total energy content of the signal is a: \_\_\_\_\_.  
a) Finite quantity                                        b) Zero  
c) Infinite quantity                                      d) Unity
- 12)  $m(t)$  is an even function, then its Fourier representation has \_\_\_\_\_.  
a)  $a_0 = 0$     b)  $a_n = 0$   
c)  $b_n = 0$     d)  $a_n = b_n$
- 13) Fourier series applies to \_\_\_\_\_.  
a) Only Periodic signals  
b) Only aperiodic signals  
c) Both periodic and aperiodic signals  
d) Only random signals
- 14) A system which is linear is said to obey the rules of \_\_\_\_\_.  
a) scaling    b) additivity  
c) shifting and scaling                                    d) both scaling and additivity

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions compulsory.  
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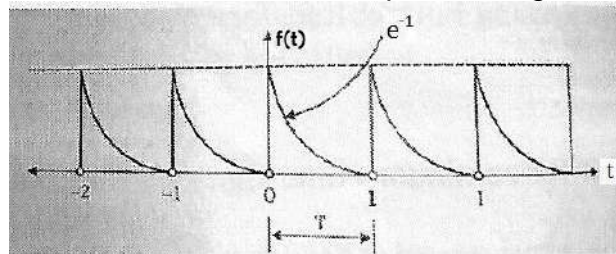
**Section – I**

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

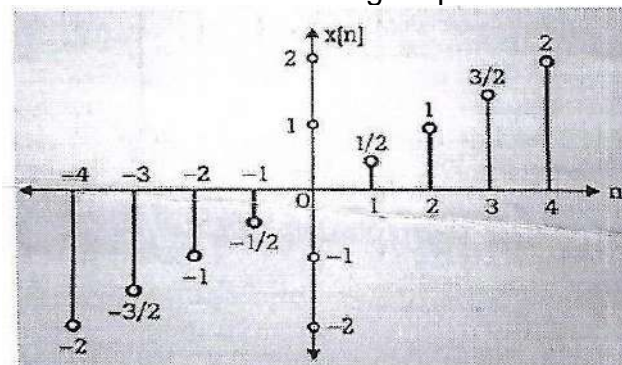
- a) Verify following properties for the system  $y(t) = x(t + 2)$ .
- 1) Static/Dynamic
  - 2) Causality
  - 3) Time Variance
- b) Find even and odd parts of the signal  
 $x[n] = 1; -2 \leq n \leq 2$
- c) Check following signal periodicity. If periodic, find the fundamental time period.  
 $x(t) = 2 \cos(3t) + 3 \sin(7t)$
- d) Explain Dirichlet's conditions.

**Q.3 Attempt any two of the following.** **16**

- a) Find the exponential Fourier series for the periodic signal  $x(t)$ .



- b) Refer the sketch below and draw following sequences:



- 1)  $x[-n] u[n] + x[n]$
  - 2)  $x[n + 2] + x[1 - n]$
- c) Convolve the following signals:  
 $X(t) = e^{-2t} \cdot u(t)$  and  $h(t) = u(t + 2)$

## Section – II

**Q.4 Attempt any four of the following.**

**16**

- a) Obtain the Fourier transform of  $x(t) = e^{-3t} u(t)$ . Sketch Magnitude spectrum.
- b) Define Spectral density & state its properties.
- c) A discrete time LTI system is given by the transfer function.

$$H(z) = \frac{3 - 4z^{-1}}{1 - 3.5z^{-1} + 1.5z^{-2}}$$

Specify the ROC of  $H(z)$  and determine impulse response  $h[n]$  if the system is stable.

- d) The analog signal  $x(t)$  is given below.

$$x(t) = 5 \sin(150\pi t) + 6 \cos(1400\pi t) - \sin(350\pi t)$$

Calculate the Nyquist sampling rate for the signal.

- e) Explain how to represent periodic signal using Fourier transform?

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

**12**

- a) State and explain the sampling theorem for continuous time signals.
- b) Compute Fourier transform of following signals. Sketch magnitude transforms.

1)  $x_1(t) = e^{-3(t-2)} u(t-2)$

2)  $x(t) = \delta(t-3)$

- c) State

1) Time Shifting.

2) Differentiation Properties of Fourier transform

Determine time domain signal  $x(t)$  whose Fourier transform  $X(j\omega)$  is as below.

$$X(j\omega) = \begin{cases} 3 & \text{for } -1 \leq \omega \leq 1 \\ 0 & \text{otherwise} \end{cases}$$





Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
SIGNALS AND SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions compulsory.  
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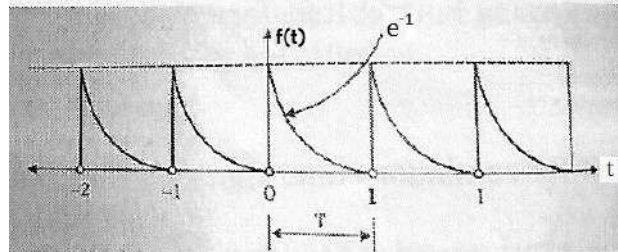
**Section – I**

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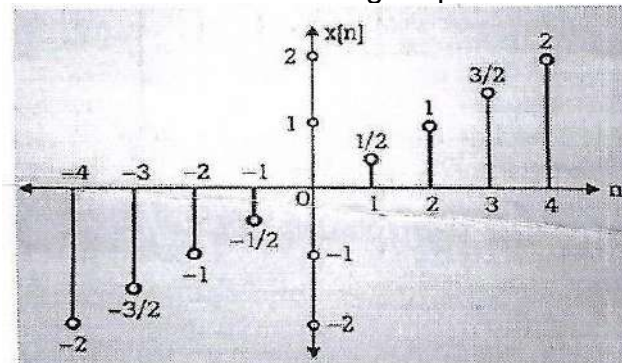
- a) Verify following properties for the system  $y(t) = x(t + 2)$ .
- 1) Static/Dynamic
  - 2) Causality
  - 3) Time Variance
- b) Find even and odd parts of the signal  
 $x[n] = 1; -2 \leq n \leq 2$
- c) Check following signal periodicity. If periodic, find the fundamental time period.  
 $x(t) = 2 \cos(3t) + 3 \sin(7t)$
- d) Explain Dirichlet's conditions.

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- b) Refer the sketch below and draw following sequences:



- 1)  $x[-n] u[n] + x[n]$
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- c) Convolve the following signals:  
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## Section – II

**Q.4 Attempt any four of the following.**

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- a) Obtain the Fourier transform of  $x(t) = e^{-3t} u(t)$ . Sketch Magnitude spectrum.
- b) Define Spectral density & state its properties.
- c) A discrete time LTI system is given by the transfer function.

$$H(z) = \frac{3 - 4z^{-1}}{1 - 3.5z^{-1} + 1.5z^{-2}}$$

Specify the ROC of  $H(z)$  and determine impulse response  $h[n]$  if the system is stable.

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- c) State

1) Time Shifting.

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Determine time domain signal  $x(t)$  whose Fourier transform  $X(j\omega)$  is as below.

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Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 4) The autocorrelation function is \_\_\_\_\_.
 

a) Even	b) Odd
c) Both	d) None of these
- 5) Which of the following is the method used for reconstruction of signal from its samples?
 

a) Zero order hold	b) Linear interpolation
c) Both a) and b)	d) None of these
- 6) Does the system  $h(t) = \exp(-7t) u(t)$  correspond to a stable system?
 

a) Yes	b) No
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- 7) Find the value of  $h[n] * \delta [n - 1]$ ,  $\delta[n]$  being the delta function.
 

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- a) Zeros                                        b) Poles  
c) Both Poles and Zeros                      d) None
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- a)  $\delta(\omega)$                                       b)  $2\pi\delta(\omega)$   
c) 1    d) can't define

Seat No.	
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**S.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
SIGNALS AND SYSTEMS**

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

Max. Marks: 56

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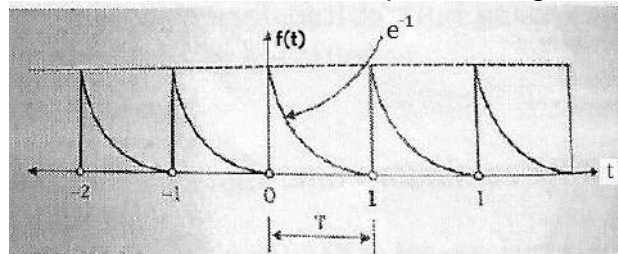
**Section – I**

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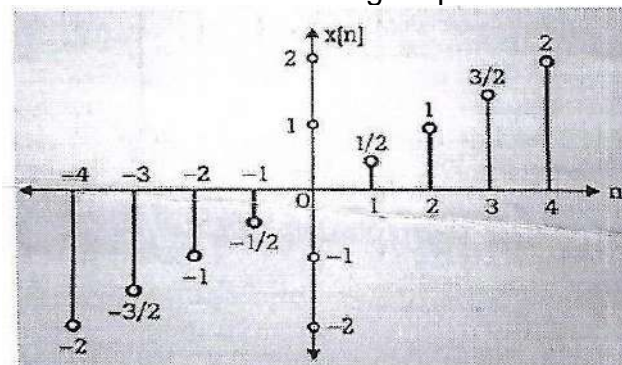
- a) Verify following properties for the system  $y(t) = x(t + 2)$ .
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  - 3) Time Variance
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 $x[n] = 1; -2 \leq n \leq 2$
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 $x(t) = 2 \cos(3t) + 3 \sin(7t)$
- d) Explain Dirichlet's conditions.

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- b) Refer the sketch below and draw following sequences:



- 1)  $x[-n] u[n] + x[n]$
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- c) Convolve the following signals:  
 $X(t) = e^{-2t} \cdot u(t)$  and  $h(t) = u(t + 2)$

## Section – II

**Q.4 Attempt any four of the following.**

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- a) Obtain the Fourier transform of  $x(t) = e^{-3t} u(t)$ . Sketch Magnitude spectrum.
- b) Define Spectral density & state its properties.
- c) A discrete time LTI system is given by the transfer function.

$$H(z) = \frac{3 - 4z^{-1}}{1 - 3.5z^{-1} + 1.5z^{-2}}$$

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

**12**

- a) State and explain the sampling theorem for continuous time signals.
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1)  $x_1(t) = e^{-3(t-2)} u(t-2)$

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- c) State

1) Time Shifting.

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$$X(j\omega) = \begin{cases} 3 & \text{for } -1 \leq \omega \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**CONTROL SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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 3) Assume suitable data if required.

**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 control system having damping factor between 0 and 1, will give \_\_\_\_\_.  
 a) Critically damped response      b) Underdamped response  
 c) Undamped response                d) No response
- 2) A node having only outgoing branches is called as \_\_\_\_\_.  
 a) Source node                            b) Sink node  
 c) Output node                            d) Both b and c
- 3) The output of the closed loop control systems is the function of \_\_\_\_\_.  
 a) Input                                      b) Output  
 c) Input and feedback signal        d) Output and feedback signal
- 4) The transient response of feedback system with damping factor less than unity \_\_\_\_\_.  
 a) Rises slowly                            b) Rises quickly  
 c) Decays quickly                        d) None of these
- 5) Which of the following state is/are correct statements?  
 I Type of the system is obtained from open loop transfer function  
 II Steady state analysis depends on the type of the system  
 III Transient state analysis depends on order of the system  
 a) Only I                                    b) II & III  
 c) I & III                                    d) I, II & III
- 6) Loops which do not possess any common node are called as \_\_\_\_\_.  
 a) Forward loops                        b) Feedback loops  
 c) Touching loops                        d) Non touching loops
- 7) One of the basic requirements of a servomotor is that it must produce high torque at all \_\_\_\_\_.  
 a) Loads                                      b) Frequencies  
 c) Speeds                                    d) Voltages

- 8) Routh Hurwitz criterion gives \_\_\_\_\_.
- a) Number of roots in the right half of the s-plane
  - b) Value of the roots
  - c) Number of roots in the left half of the s-plane
  - d) Number of roots in the top half of the s-plane
- 9) If a pole is located at origin, how does it get represented on the magnitude plot?
- a)  $-10 \log(\omega)$  dB
  - b)  $-20 \log(\omega)$  dB
  - c)  $-40 \log(\omega)$  dB
  - d)  $-60 \log(\omega)$  dB
- 10) Which one of the following is not the property of root loci?
- a) The root locus is symmetrical about imaginary axis
  - b) They start from the open loop poles and terminate at the open loop zeroes
  - c) The breakaway points are determined from  $dk/ds = 0$
  - d) Segments of the real axis are the part of the root locus if and only if the total number of real poles and zeroes to their right is odd
- 11) At which frequency does the magnitude of the system becomes zero dB?
- a) Resonant frequency
  - b) Cut-off frequency
  - c) Gain crossover frequency
  - d) Phase crossover frequency
- 12) With regard to the filtering capacity the lead compensator and lag compensator are respectively \_\_\_\_\_.
- a) Low pass and high pass filter
  - b) High pass and low pass filter
  - c) Both high pass filter
  - d) Both low pass filters
- 13) If the system is specified by open loop transfer function  $G(s)H(s) = k/s(s+3)(s+2)$ , how many root loci proceed to end at infinity?
- a) 2
  - b) 3
  - c) 5
  - d) 6
- 14) Due to an addition of pole at origin, the polar plot gets shifted by \_\_\_\_\_ at  $\omega = 0$ ?
- a)  $-45^\circ$
  - b)  $-60^\circ$
  - c)  $-90^\circ$
  - d)  $-180^\circ$

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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
CONTROL SYSTEMS**

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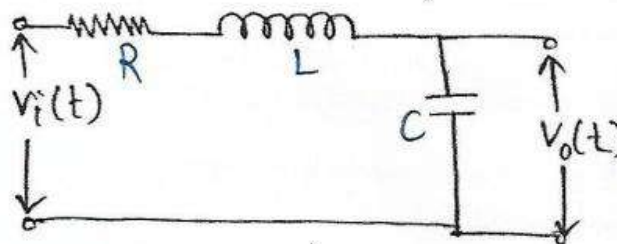
Max. Marks: 56

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**Section I**

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

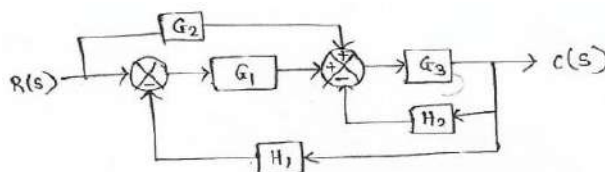
- Differentiate between open loop & closed loop control systems.
- Explain use of potentiometer as an error detector.
- Explain poles, zeros and time constant form of transfer function. Write following transfer function in Time Constant form.  $T(S) = \frac{-7s-15}{(s+3)(s+5)}$
- Define transfer function and find transfer function for given circuit



- Explain working principle and construction of tacho generator.

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

- Derive the relation for peak time of Second order system.
- Determine position, velocity and acceleration constant for unity feedback control system with open loop transfer function.  $G(s) = \frac{s(s+5)}{(s+3)(1+3s)}$
- Determine the overall transfer function for the following system using Mason's gain formula.



**Section II**

**Q.4 Solve any four of the following questions.** **16**

- Explain with example special case number one of Routh's criterion.
- For  $G(s)H(s) = \frac{K}{s(s+1)(s+4)}$ , determine the coordinates of valid breakaway points.
- Explain the nature of Bode plots for
  - Poles at origin
  - Zeros at origin
- Consider a Type 0 system with open loop transfer function  $G(s)H(s) = \frac{1}{1+Ts}$ , where T is constant. Obtain its polar plot.
- Explain with neat diagram lead compensator.

**Q.5 Solve any Two.**

- a) Sketch the Bode plot for the system having  $G(s)H(s) = \frac{20}{s(1+0.1s)}$
- b) Explain the following rules for construction of root locus with example
- 1) Angle of asymptotes
  - 2) Determination of centroid
  - 3) Break way point (with general predictions)
- c) The output  $c(t)$  of a control system is related to its input  $r(t)$  by  $[s^4 + 2s^3 + 2s^2 + (3 + K)s + K]C(s) = K(s + 1)R(s)$   
Determine the limiting positive values of  $K$  for stability.



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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**CONTROL SYSTEMS**

Day & Date: Friday, 06-12-2019  
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Duration: 30 Minutes

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- 2) If a pole is located at origin, how does it get represented on the magnitude plot?
 

a) $-10 \log(\omega)$ dB	b) $-20 \log(\omega)$ dB
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- 3) Which one of the following is not the property of root loci?
  - a) The root locus is symmetrical about imaginary axis
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a) 2	b) 3
c) 5	d) 6
- 7) Due to an addition of pole at origin, the polar plot gets shifted by \_\_\_\_\_ at  $\omega = 0$ ?
 

a) $-45^\circ$	b) $-60^\circ$
c) $-90^\circ$	d) $-180^\circ$

- 8) A control system having damping factor between 0 and 1, will give \_\_\_\_\_.
- a) Critically damped response      b) Underdamped response  
c) Undamped response                d) No response
- 9) A node having only outgoing branches is called as \_\_\_\_\_.
- a) Source node                            b) Sink node  
c) Output node                            d) Both b and c
- 10) The output of the closed loop control systems is the function of \_\_\_\_\_.
- a) Input                                      b) Output  
c) Input and feedback signal          d) Output and feedback signal
- 11) The transient response of feedback system with damping factor less than unity \_\_\_\_\_.
- a) Rises slowly                              b) Rises quickly  
c) Decays quickly                         d) None of these
- 12) Which of the following state is/are correct statements?
- I Type of the system is obtained from open loop transfer function  
II Steady state analysis depends on the type of the system  
III Transient state analysis depends on order of the system
- a) Only I                                      b) II & III  
c) I & III                                      d) I, II & III
- 13) Loops which do not possess any common node are called as \_\_\_\_\_.
- a) Forward loops                            b) Feedback loops  
c) Touching loops                          d) Non touching loops
- 14) One of the basic requirements of a servomotor is that it must produce high torque at all \_\_\_\_\_.
- a) Loads                                        b) Frequencies  
c) Speeds                                      d) Voltages

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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
CONTROL SYSTEMS**

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

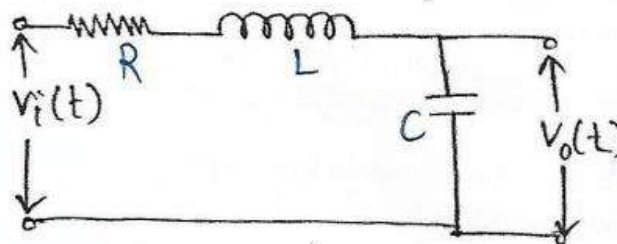
Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if required.

**Section I**

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

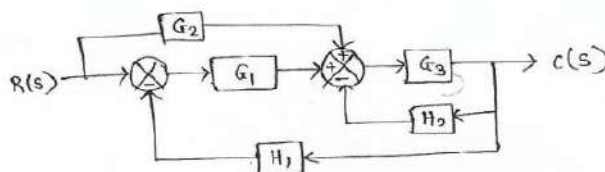
- Differentiate between open loop & closed loop control systems.
- Explain use of potentiometer as an error detector.
- Explain poles, zeros and time constant form of transfer function. Write following transfer function in Time Constant form.  $T(S) = \frac{-7s-15}{(s+3)(s+5)}$
- Define transfer function and find transfer function for given circuit



- Explain working principle and construction of tacho generator.

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

- Derive the relation for peak time of Second order system.
- Determine position, velocity and acceleration constant for unity feedback control system with open loop transfer function.  $G(s) = \frac{s(s+5)}{(s+3)(1+3s)}$
- Determine the overall transfer function for the following system using Mason's gain formula.



**Section II**

**Q.4 Solve any four of the following questions. 16**

- Explain with example special case number one of Routh's criterion.
- For  $G(s)H(s) = \frac{K}{s(s+1)(s+4)}$ , determine the coordinates of valid breakaway points.
- Explain the nature of Bode plots for
  - Poles at origin
  - Zeros at origin
- Consider a Type 0 system with open loop transfer function  $G(s)H(s) = \frac{1}{1+Ts}$ , where T is constant. Obtain its polar plot.
- Explain with neat diagram lead compensator.

**Q.5 Solve any Two.**

- a) Sketch the Bode plot for the system having  $G(s)H(s) = \frac{20}{s(1+0.1s)}$
- b) Explain the following rules for construction of root locus with example
- 1) Angle of asymptotes
  - 2) Determination of centroid
  - 3) Break way point (with general predictions)
- c) The output  $c(t)$  of a control system is related to its input  $r(t)$  by  $[s^4 + 2s^3 + 2s^2 + (3 + K)s + K]C(s) = K(s + 1)R(s)$   
Determine the limiting positive values of  $K$  for stability.



- 8) With regard to the filtering capacity the lead compensator and lag compensator are respectively \_\_\_\_\_.
- a) Low pass and high pass filter    b) High pass and low pass filter  
c) Both high pass filter              d) Both low pass filters
- 9) If the system is specified by open loop transfer function  $G(s)H(s) = k/s(s+3)(s+2)$ , how many root loci proceed to end at infinity?
- a) 2    b) 3  
c) 5    d) 6
- 10) Due to an addition of pole at origin, the polar plot gets shifted by \_\_\_\_\_ at  $\omega = 0$ ?
- a)  $-45^\circ$                                       b)  $-60^\circ$   
c)  $-90^\circ$                                       d)  $-180^\circ$
- 11) A control system having damping factor between 0 and 1, will give \_\_\_\_\_.
- a) Critically damped response    b) Underdamped response  
c) Undamped response              d) No response
- 12) A node having only outgoing branches is called as \_\_\_\_\_.
- a) Source node                              b) Sink node  
c) Output node                              d) Both b and c
- 13) The output of the closed loop control systems is the function of \_\_\_\_\_.
- a) Input                                        b) Output  
c) Input and feedback signal          d) Output and feedback signal
- 14) The transient response of feedback system with damping factor less than unity \_\_\_\_\_.
- a) Rises slowly                              b) Rises quickly  
c) Decays quickly                        d) None of these

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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
CONTROL SYSTEMS**

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

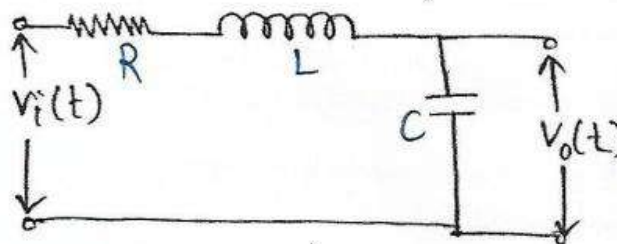
Max. Marks: 56

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

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

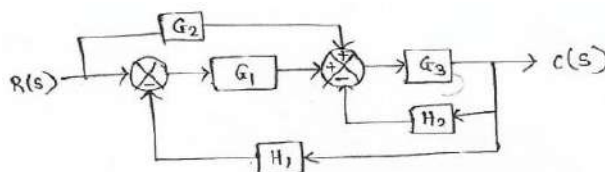
- Differentiate between open loop & closed loop control systems.
- Explain use of potentiometer as an error detector.
- Explain poles, zeros and time constant form of transfer function. Write following transfer function in Time Constant form.  $T(S) = \frac{-7s-15}{(s+3)(s+5)}$
- Define transfer function and find transfer function for given circuit



- Explain working principle and construction of tacho generator.

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

- Derive the relation for peak time of Second order system.
- Determine position, velocity and acceleration constant for unity feedback control system with open loop transfer function.  $G(s) = \frac{s(s+5)}{(s+3)(1+3s)}$
- Determine the overall transfer function for the following system using Mason's gain formula.



**Section II**

**Q.4 Solve any four of the following questions.** **16**

- Explain with example special case number one of Routh's criterion.
- For  $G(s)H(s) = \frac{K}{s(s+1)(s+4)}$ , determine the coordinates of valid breakaway points.
- Explain the nature of Bode plots for
  - Poles at origin
  - Zeros at origin
- Consider a Type 0 system with open loop transfer function  $G(s)H(s) = \frac{1}{1+Ts}$ , where T is constant. Obtain its polar plot.
- Explain with neat diagram lead compensator.

**Q.5 Solve any Two.**

- a) Sketch the Bode plot for the system having  $G(s)H(s) = \frac{20}{s(1+0.1s)}$
- b) Explain the following rules for construction of root locus with example
- 1) Angle of asymptotes
  - 2) Determination of centroid
  - 3) Break way point (with general predictions)
- c) The output  $c(t)$  of a control system is related to its input  $r(t)$  by  $[s^4 + 2s^3 + 2s^2 + (3 + K)s + K]C(s) = K(s + 1)R(s)$   
Determine the limiting positive values of  $K$  for stability.



Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**CONTROL SYSTEMS**

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

Max. Marks: 70

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

**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 not the property of root loci?
  - a) The root locus is symmetrical about imaginary axis
  - b) They start from the open loop poles and terminate at the open loop zeroes
  - c) The breakaway points are determined from  $dk/ds = 0$
  - d) Segments of the real axis are the part of the root locus if and only if the total number of real poles and zeroes to their right is odd
- 2) At which frequency does the magnitude of the system becomes zero dB?
  - a) Resonant frequency
  - b) Cut-off frequency
  - c) Gain crossover frequency
  - d) Phase crossover frequency
- 3) With regard to the filtering capacity the lead compensator and lag compensator are respectively \_\_\_\_\_.
  - a) Low pass and high pass filter
  - b) High pass and low pass filter
  - c) Both high pass filter
  - d) Both low pass filters
- 4) If the system is specified by open loop transfer function  $G(s)H(s) = k/s(s+3)(s+2)$ , how many root loci proceed to end at infinity?
  - a) 2
  - b) 3
  - c) 5
  - d) 6
- 5) Due to an addition of pole at origin, the polar plot gets shifted by \_\_\_\_\_ at  $\omega = 0$ ?
  - a)  $-45^\circ$
  - b)  $-60^\circ$
  - c)  $-90^\circ$
  - d)  $-180^\circ$
- 6) A control system having damping factor between 0 and 1, will give \_\_\_\_\_.
  - a) Critically damped response
  - b) Underdamped response
  - c) Undamped response
  - d) No response
- 7) A node having only outgoing branches is called as \_\_\_\_\_.
  - a) Source node
  - b) Sink node
  - c) Output node
  - d) Both b and c



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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
CONTROL SYSTEMS**

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

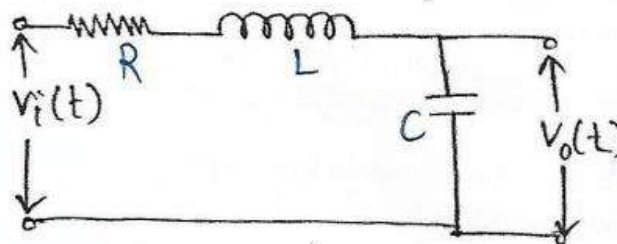
Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if required.

**Section I**

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

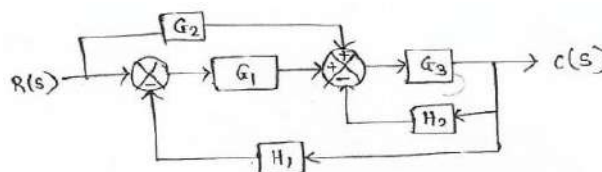
- Differentiate between open loop & closed loop control systems.
- Explain use of potentiometer as an error detector.
- Explain poles, zeros and time constant form of transfer function. Write following transfer function in Time Constant form.  $T(S) = \frac{-7s-15}{(s+3)(s+5)}$
- Define transfer function and find transfer function for given circuit



- Explain working principle and construction of tacho generator.

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

- Derive the relation for peak time of Second order system.
- Determine position, velocity and acceleration constant for unity feedback control system with open loop transfer function.  $G(s) = \frac{s(s+5)}{(s+3)(1+3s)}$
- Determine the overall transfer function for the following system using Mason's gain formula.



**Section II**

**Q.4 Solve any four of the following questions. 16**

- Explain with example special case number one of Routh's criterion.
- For  $G(s)H(s) = \frac{K}{s(s+1)(s+4)}$ , determine the coordinates of valid breakaway points.
- Explain the nature of Bode plots for
  - Poles at origin
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- Consider a Type 0 system with open loop transfer function  $G(s)H(s) = \frac{1}{1+Ts}$ , where T is constant. Obtain its polar plot.
- Explain with neat diagram lead compensator.

**Q.5 Solve any Two.**

- a) Sketch the Bode plot for the system having  $G(s)H(s) = \frac{20}{s(1+0.1s)}$
- b) Explain the following rules for construction of root locus with example
- 1) Angle of asymptotes
  - 2) Determination of centroid
  - 3) Break way point (with general predictions)
- c) The output  $c(t)$  of a control system is related to its input  $r(t)$  by  $[s^4 + 2s^3 + 2s^2 + (3 + K)s + K]C(s) = K(s + 1)R(s)$   
Determine the limiting positive values of  $K$  for stability.

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 70

- Instructions:** 1) Q. No 1 is compulsory and should be solved in first 30 minutes in answer book.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data whenever necessary.
- 4) Draw neat diagrams wherever required.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) DFT of a impulse function is \_\_\_\_\_.
 

a) $\delta[n]$	b) $\delta[n - 1]$
c) 1	d) None
- 2) Circular convolution of {2,3,1,4} and {1,2,2,3} is \_\_\_\_\_.
 

a) {21,18,23,18}	b) {23,18,21,18}
c) {0,18, 0,18}	d) {21,18,18,23}
- 3) What is the ROC of a causal finite length sequence?
 

a) $r_2 <  z  < r_1$	b) $ z  > r_1$
c) $ z  < r_1$	d) None of the mentioned
- 4) In the basic butterfly structure of DIT FFT algorithm, number of complex multiplications and additions are \_\_\_\_\_.
 

a) 2 and 1 respectively	b) 1 and 2 respectively
c) 2 and 4 respectively	d) 4 and 2 respectively
- 5) The number of multipliers required for realization of FIR systems is reduced if we choose \_\_\_\_\_.
 

a) Direct form	b) Cascade form
c) Parallel form	d) Linear phase realization
- 6) The system is linear if \_\_\_\_\_.
 

a) It is a homogeneous
b) It is additive
c) It is a homogeneous or additive
d) It is a homogeneous and additive
- 7) The value of twiddle factor –  $W_8^5$  is same as that of \_\_\_\_\_.
 

a) $W_8^0$	b) $W_8^1$
c) $-W_8^4$	d) None of the mentioned
- 8) The features in which P-DSP is superior to advanced microprocessor is \_\_\_\_\_.
 

a) Low cost	b) Low power
c) Computational speed	d) Real time I/O capability

- 9) The following realization minimizes the delay elements \_\_\_\_\_.
- a) Direct form – I realization
  - b) Direct form – II realization
  - c) Cascade form realization
  - d) Parallel realization
- 10) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.
- a) Indirect addressing
  - b) Circular mode addressing
  - c) Bit reversed addressing
  - d) Memory mapped addressing
- 11) The frequency mapping from s domain to z domain using impulse invariant technique is \_\_\_\_\_.
- a) Many to many
  - b) Many to one
  - c) One to many
  - d) None of above
- 12) Which of the following is true for FIR filters?
- a) They have linear phase
  - b) Are always stable
  - c) They are all zero filters
  - d) All above a, b & c
- 13) The approximate width of the main lobe in rectangular window of length M is \_\_\_\_\_.
- a)  $6\pi/M$
  - b)  $8\pi/M$
  - c)  $12\pi/M$
  - d)  $4\pi/M$
- 14) Which of the following has the best transition width characteristics?
- a) Bartlett
  - b) Rectangular
  - c) Blackman
  - d) Hamming

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.  
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 4) Draw neat diagrams wherever required.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Find four point IDFT of DFT signal.  
 $X[k] = \{12, -4 + 4j, -4, -4 - 4j\}$   
 $\uparrow$
- b) Explain the circular convolution property of DFT.  
 c) Explain the overlap Save method with a neat diagram.  
 d) Find DFT of the sequence  $x[n] = \{1, 2, 3, 4\}$  using DIT FFT algorithm.  
 e) Draw the linear phase realization for FIR systems with length of filter M odd and M even.

**Q.3 Attempt any Two.** **12**

- a) Determine the cascade realization of given function.  

$$H[Z] = \frac{10. (1 - \frac{1}{2}Z^{-1})(1 - \frac{2}{3}Z^{-1})(1 + 2Z^{-1})}{(1 - \frac{3}{4}Z^{-1})(1 - \frac{1}{8}Z^{-1})[1 - (\frac{1}{2} + \frac{j}{2})Z^{-1}][1 - (\frac{1}{2} - \frac{j}{2})Z^{-1}]}$$
- b) Find the IDFT of  $X(k) = \{10, -1 + 3j, 0, -1 - 3j\}$  using DIF FFT.  
 c) Obtain the output of a filter using overlap add method whose input and impulse response are as below.  
 $x(n) = \{2, 0, -2, 0, 2, 1, 0, -2, -1, 0\}$  and  $h(n) = \{3, 2, 1\}$ .

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Draw and explain the structure for 4 x 4 Baran Multiplier for unsigned numbers.  
 b) Explain in detail the multiply and Accumulate (MAC) unit of digital signal processor.  
 c) Write the analog transfer function for Low Pass Butterworth filter of order 2 & cutoff frequency  $\Omega_c = 1$ .  
 Using frequency transformations convert above filter to.  
 1) Low pass filter with cutoff frequency  $\Omega_c' = 0.68$   
 2) High pass filter with cutoff frequency  $\Omega_c' = 1.414$   
 d) Explain the Windowing technique for FIR filter design along with different window functions.  
 e) Differentiate FIR and IIR filters.

**Q.5 Attempt any Two.**

- a) Convert the analog filter in to digital filter whose system function is (Assume  $T=1s$ ).

$$H(s) = \frac{1}{(s+1)(s+2)}$$

Explain in detail steps for designing IIR filter using impulse invariance method. Hence find  $H(z)$ .

- b) Explain the applications of DSP in audio processing and biomedical field.  
 c) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-j2\omega} & -\frac{\pi}{4} \leq \omega \leq \pi/4 \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using a rectangular window with window length 5. Determine the frequency response  $H(e^{j\omega})$ .



Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 70

- Instructions:** 1) Q. No 1 is compulsory and should be solved in first 30 minutes in answer book.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

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**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Find four point IDFT of DFT signal.  
 $X[k] = \{12, -4 + 4j, -4, -4 - 4j\}$   
 $\uparrow$
- b) Explain the circular convolution property of DFT.  
 c) Explain the overlap Save method with a neat diagram.  
 d) Find DFT of the sequence  $x[n] = \{1, 2, 3, 4\}$  using DIT FFT algorithm.  
 e) Draw the linear phase realization for FIR systems with length of filter M odd and M even.

**Q.3 Attempt any Two.** **12**

- a) Determine the cascade realization of given function.  

$$H[Z] = \frac{10. (1 - \frac{1}{2}Z^{-1})(1 - \frac{2}{3}Z^{-1})(1 + 2Z^{-1})}{(1 - \frac{3}{4}Z^{-1})(1 - \frac{1}{8}Z^{-1})[1 - (\frac{1}{2} + \frac{j}{2})Z^{-1}][1 - (\frac{1}{2} - \frac{j}{2})Z^{-1}]}$$
- b) Find the IDFT of  $X(k) = \{10, -1 + 3j, 0, -1 - 3j\}$  using DIF FFT.  
 c) Obtain the output of a filter using overlap add method whose input and impulse response are as below.  
 $x(n) = \{2, 0, -2, 0, 2, 1, 0, -2, -1, 0\}$  and  $h(n) = \{3, 2, 1\}$ .

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Draw and explain the structure for 4 x 4 Baran Multiplier for unsigned numbers.  
 b) Explain in detail the multiply and Accumulate (MAC) unit of digital signal processor.  
 c) Write the analog transfer function for Low Pass Butterworth filter of order 2 & cutoff frequency  $\Omega_c = 1$ .  
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 1) Low pass filter with cutoff frequency  $\Omega_c' = 0.68$   
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 e) Differentiate FIR and IIR filters.

**Q.5 Attempt any Two.**

- a) Convert the analog filter in to digital filter whose system function is (Assume  $T=1s$ ).

$$H(s) = \frac{1}{(s+1)(s+2)}$$

Explain in detail steps for designing IIR filter using impulse invariance method. Hence find  $H(z)$ .

- b) Explain the applications of DSP in audio processing and biomedical field.  
 c) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-j2\omega} & -\frac{\pi}{4} \leq \omega \leq \pi/4 \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using a rectangular window with window length 5. Determine the frequency response  $H(e^{j\omega})$ .



- 9) The approximate width of the main lobe in rectangular window of length  $M$  is \_\_\_\_\_.
- a)  $6\pi/M$
  - b)  $8\pi/M$
  - c)  $12\pi/M$
  - d)  $4\pi/M$
- 10) Which of the following has the best transition width characteristics?
- a) Bartlett
  - b) Rectangular
  - c) Blackman
  - d) Hamming
- 11) DFT of a impulse function is \_\_\_\_\_.
- a)  $\delta[n]$
  - b)  $\delta[n - 1]$
  - c) 1
  - d) None
- 12) Circular convolution of  $\{2,3,1,4\}$  and  $\{1,2,2,3\}$  is \_\_\_\_\_.
- a)  $\{21,18,23,18\}$
  - b)  $\{23,18,21,18\}$
  - c)  $\{0,18, 0,18\}$
  - d)  $\{21,18,18,23\}$
- 13) What is the ROC of a causal finite length sequence?
- a)  $r_2 < |z| < r_1$
  - b)  $|z| > r_1$
  - c)  $|z| < r_1$
  - d) None of the mentioned
- 14) In the basic butterfly structure of DIT FFT algorithm, number of complex multiplications and additions are \_\_\_\_\_.
- a) 2 and 1 respectively
  - b) 1 and 2 respectively
  - c) 2 and 4 respectively
  - d) 4 and 2 respectively

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.  
 3) Assume suitable data wherever necessary.  
 4) Draw neat diagrams wherever required.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Find four point IDFT of DFT signal.  
 $X[k] = \{12, -4 + 4j, -4, -4 - 4j\}$   
 $\uparrow$
- b) Explain the circular convolution property of DFT.  
 c) Explain the overlap Save method with a neat diagram.  
 d) Find DFT of the sequence  $x[n] = \{1, 2, 3, 4\}$  using DIT FFT algorithm.  
 e) Draw the linear phase realization for FIR systems with length of filter M odd and M even.

**Q.3 Attempt any Two.** **12**

- a) Determine the cascade realization of given function.  

$$H[Z] = \frac{10. (1 - \frac{1}{2}Z^{-1})(1 - \frac{2}{3}Z^{-1})(1 + 2Z^{-1})}{(1 - \frac{3}{4}Z^{-1})(1 - \frac{1}{8}Z^{-1})[1 - (\frac{1}{2} + \frac{j}{2})Z^{-1}][1 - (\frac{1}{2} - \frac{j}{2})Z^{-1}]}$$
- b) Find the IDFT of  $X(k) = \{10, -1 + 3j, 0, -1 - 3j\}$  using DIF FFT.  
 c) Obtain the output of a filter using overlap add method whose input and impulse response are as below.  
 $x(n) = \{2, 0, -2, 0, 2, 1, 0, -2, -1, 0\}$  and  $h(n) = \{3, 2, 1\}$ .

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Draw and explain the structure for 4 x 4 Baran Multiplier for unsigned numbers.  
 b) Explain in detail the multiply and Accumulate (MAC) unit of digital signal processor.  
 c) Write the analog transfer function for Low Pass Butterworth filter of order 2 & cutoff frequency  $\Omega_c = 1$ .  
 Using frequency transformations convert above filter to.  
 1) Low pass filter with cutoff frequency  $\Omega_c' = 0.68$   
 2) High pass filter with cutoff frequency  $\Omega_c' = 1.414$   
 d) Explain the Windowing technique for FIR filter design along with different window functions.  
 e) Differentiate FIR and IIR filters.

**Q.5 Attempt any Two.**

- a) Convert the analog filter in to digital filter whose system function is (Assume  $T=1s$ ).

$$H(s) = \frac{1}{(s+1)(s+2)}$$

Explain in detail steps for designing IIR filter using impulse invariance method. Hence find  $H(z)$ .

- b) Explain the applications of DSP in audio processing and biomedical field.  
 c) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-j2\omega} & -\frac{\pi}{4} \leq \omega \leq \pi/4 \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using a rectangular window with window length 5. Determine the frequency response  $H(e^{j\omega})$ .



Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 70

- Instructions:** 1) Q. No 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data whenever necessary.  
 4) Draw neat diagrams wherever required.

**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 mode that is convenient for FFT computation is \_\_\_\_\_.  
 a) Indirect addressing                      b) Circular mode addressing  
 c) Bit reversed addressing                d) Memory mapped addressing
- 2) The frequency mapping from s domain to z domain using impulse invariant technique is \_\_\_\_\_.  
 a) Many to many                            b) Many to one  
 c) One to many                                d) None of above
- 3) Which of the following is true for FIR filters?  
 a) They have linear phase                b) Are always stable  
 c) They are all zero filters                d) All above a, b & c
- 4) The approximate width of the main lobe in rectangular window of length M is \_\_\_\_\_.  
 a)  $6\pi/M$                                         b)  $8\pi/M$   
 c)  $12\pi/M$                                         d)  $4\pi/M$
- 5) Which of the following has the best transition width characteristics?  
 a) Bartlett                                        b) Rectangular  
 c) Blackman                                     d) Hamming
- 6) DFT of a impulse function is \_\_\_\_\_.  
 a)  $\delta[n]$                                          b)  $\delta[n - 1]$   
 c) 1     d) None
- 7) Circular convolution of {2,3,1,4} and {1,2,2,3} is \_\_\_\_\_.  
 a) {21,18,23,18}                            b) {23,18,21,18}  
 c) {0,18, 0,18}                                d) {21,18,18,23}
- 8) What is the ROC of a causal finite length sequence?  
 a)  $r_2 < |z| < r_1$                             b)  $|z| > r_1$   
 c)  $|z| < r_1$                                       d) None of the mentioned
- 9) In the basic butterfly structure of DIT FFT algorithm, number of complex multiplications and additions are \_\_\_\_\_.  
 a) 2 and 1 respectively                    b) 1 and 2 respectively  
 c) 2 and 4 respectively                    d) 4 and 2 respectively

- 10) The number of multipliers required for realization of FIR systems is reduced if we choose \_\_\_\_\_.
- a) Direct form
  - b) Cascade form
  - c) Parallel form
  - d) Linear phase realization
- 11) The system is linear if \_\_\_\_\_.
- a) It is a homogeneous
  - b) It is additive
  - c) It is a homogeneous or additive
  - d) It is a homogeneous and additive
- 12) The value of twiddle factor  $-W_8^5$  is same as that of \_\_\_\_\_.
- a)  $W_8^0$
  - b)  $W_8^1$
  - c)  $-W_8^4$
  - d) None of the mentioned
- 13) The features in which P-DSP is superior to advanced microprocessor is \_\_\_\_\_.
- a) Low cost
  - b) Low power
  - c) Computational speed
  - d) Real time I/O capability
- 14) The following realization minimizes the delay elements \_\_\_\_\_.
- a) Direct form – I realization
  - b) Direct form – II realization
  - c) Cascade form realization
  - d) Parallel realization

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

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 4) Draw neat diagrams wherever required.

**Section – I**

**Q.2 Attempt any Four.** **16**

- a) Find four point IDFT of DFT signal.  
 $X[k] = \{12, -4 + 4j, -4, -4 - 4j\}$   
 $\uparrow$
- b) Explain the circular convolution property of DFT.  
 c) Explain the overlap Save method with a neat diagram.  
 d) Find DFT of the sequence  $x[n] = \{1, 2, 3, 4\}$  using DIT FFT algorithm.  
 e) Draw the linear phase realization for FIR systems with length of filter M odd and M even.

**Q.3 Attempt any Two.** **12**

- a) Determine the cascade realization of given function.  

$$H[Z] = \frac{10. (1 - \frac{1}{2}Z^{-1})(1 - \frac{2}{3}Z^{-1})(1 + 2Z^{-1})}{(1 - \frac{3}{4}Z^{-1})(1 - \frac{1}{8}Z^{-1})[1 - (\frac{1}{2} + \frac{j}{2})Z^{-1}][1 - (\frac{1}{2} - \frac{j}{2})Z^{-1}]}$$
- b) Find the IDFT of  $X(k) = \{10, -1 + 3j, 0, -1 - 3j\}$  using DIF FFT.  
 c) Obtain the output of a filter using overlap add method whose input and impulse response are as below.  
 $x(n) = \{2, 0, -2, 0, 2, 1, 0, -2, -1, 0\}$  and  $h(n) = \{3, 2, 1\}$ .

**Section – II**

**Q.4 Attempt any Four.** **16**

- a) Draw and explain the structure for 4 x 4 Baron Multiplier for unsigned numbers.  
 b) Explain in detail the multiply and Accumulate (MAC) unit of digital signal processor.  
 c) Write the analog transfer function for Low Pass Butterworth filter of order 2 & cutoff frequency  $\Omega_c = 1$ .  
 Using frequency transformations convert above filter to.  
 1) Low pass filter with cutoff frequency  $\Omega_c' = 0.68$   
 2) High pass filter with cutoff frequency  $\Omega_c' = 1.414$   
 d) Explain the Windowing technique for FIR filter design along with different window functions.  
 e) Differentiate FIR and IIR filters.

**Q.5 Attempt any Two.**

- a) Convert the analog filter in to digital filter whose system function is (Assume  $T=1s$ ).

$$H(s) = \frac{1}{(s+1)(s+2)}$$

Explain in detail steps for designing IIR filter using impulse invariance method. Hence find  $H(z)$ .

- b) Explain the applications of DSP in audio processing and biomedical field.  
 c) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} e^{-j2\omega} & -\frac{\pi}{4} \leq \omega \leq \pi/4 \\ 0 & \frac{\pi}{4} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using a rectangular window with window length 5. Determine the frequency response  $H(e^{j\omega})$ .



- 10) The PIC 16F877 has \_\_\_\_\_ I/O ports.
- |      |      |
|------|------|
| a) 4 | b) 5 |
| c) 6 | d) 3 |
- 11) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
- |         |         |
|---------|---------|
| a) 8,13 | b) 13,8 |
| c) 8,12 | d) 12,8 |
- 12) What is the address of the last location of on-chip flash program memory for PIC 16F877?
- |           |           |
|-----------|-----------|
| a) 0FFF h | b) 1FFF h |
| c) FFFF h | d) 7FFF h |
- 13) The instruction “movlw D’200” loads the W register with \_\_\_\_\_.
- |         |            |
|---------|------------|
| a) 200h | b) C8h     |
| c) 8C h | d) 1100100 |
- 14) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
- |            |            |
|------------|------------|
| a) Timer 0 | b) Timer 2 |
| c) Timer 1 | d) Timer 3 |

Seat No.	
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**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Wednesday, 11-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data whenever necessary.

**Section - I**

- Q.2 Solve any four:** **16**
- a) Compare RISC and CISC architecture.
  - b) Write a program to add two 16 bit hex numbers.
  - c) How to enable/disable the interrupts in 8051? Explain with respective SFR.
  - d) Interface 8 LEDs to 8051 and write a program to turn on and off alternate LEDs continuously.
  - e) Explain the modes of operation of Timer in 8051.
- Q.3 Solve any two:** **12**
- a) Write a program for finding even and odd numbers form a given array of 10 elements.
  - b) Write an 8051 program to toggle pin P1.0 continuously every 250ms. Use Timer1, mode1 to create the delay. Assume XTAL= 11.0592MHz.
  - c) Read data through ports 0, 1, and 2, one after other and transfer this data serially, continuously.

**Section – II**

- Q.4 Solve any four:** **16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 0 in PIC 16F877.
- Q.5 Solve any two:** **12**
- a) Draw and explain interfacing of 16\*2 LCD to 8051. Write a program to display "HI" on the LCD.
  - b) Draw and explain interfacing of DAC to 8051. Write a program
    - 1) To generate triangular wave and
    - 2) To generate a saw tooth wave.
  - c) Draw and explain interfacing of 16K x 8 Data RAM to 8051. Write a assembly program to transfer 30 bytes starting at 1000h to 2000hh in external Data RAM.

Seat No.	
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**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Wednesday, 11-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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

**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 8051 an Timer1 interrupt vector address is of \_\_\_\_\_.
  - a) 000Bh
  - b) 001Bh
  - c) 0013h
  - d) 0023h
- 2) The PIC 16F877 has \_\_\_\_\_ on chip flash program memory.
  - a) 4K x 8 bytes
  - b) 4K x 14 words
  - c) 8K x 8 bytes
  - d) 8K x 14 words
- 3) The PIC 16F877 has \_\_\_\_\_ I/O ports.
  - a) 4
  - b) 5
  - c) 6
  - d) 3
- 4) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
  - a) 8,13
  - b) 13,8
  - c) 8,12
  - d) 12,8
- 5) What is the address of the last location of on-chip flash program memory for PIC 16F877?
  - a) 0FFF h
  - b) 1FFF h
  - c) FFFF h
  - d) 7FFF h
- 6) The instruction "movlw D'200" loads the W register with \_\_\_\_\_.
  - a) 200h
  - b) C8h
  - c) 8C h
  - d) 1100100
- 7) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
  - a) Timer 0
  - b) Timer 2
  - c) Timer 1
  - d) Timer 3
- 8) The I/O port that does not have a dual-purpose role is \_\_\_\_\_.
  - a) PORT 0
  - b) PORT 1
  - c) PORT 2
  - d) PORT 3
- 9) The ADC0808 has \_\_\_\_\_ resolution.
  - a) 4-bit
  - b) 8-bit
  - c) 16-bit
  - d) 32-bit
- 10) The total amount of external code memory that can be interfaced to the 8051 is \_\_\_\_\_.
  - a) 32K
  - b) 16K
  - c) 46K
  - d) 64K



- 11) If a period is 0.33 ms between the serial bits, we can transfer \_\_\_\_\_ in one second when SCON sets for mode 2:
- a) 300 characters
  - b) 275 characters
  - c) 30 characters
  - d) 272 characters
- 12) Of the lower 128 byte of RAM in the 8051, how many bytes are bit addressable?
- a) eight
  - b) thirty two
  - c) sixteen
  - d) four
- 13) In 8051, serial communication mode 1, the baud rate will be \_\_\_\_\_.
- a) variable
  - b)  $f_{osc}/164$
  - c)  $f_{osc}/32$
  - d)  $f_{osc}/12$
- 14) Bit address 0x00 and byte address 0x00 are for the \_\_\_\_\_.
- a) Bit 0 at 0x20 and the byte at 0x00 in the internal RAM
  - b) Bit 0 at 0x00 and the byte at 0x00 in the internal RAM
  - c) Bit = 0 in a SFR and the byte = 0x00
  - d) Bit 0 at 0x20 and the byte at 0x00 in the external RAM

Seat No.	
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**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Wednesday, 11-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data whenever necessary.

**Section - I**

- Q.2 Solve any four:** **16**
- a) Compare RISC and CISC architecture.
  - b) Write a program to add two 16 bit hex numbers.
  - c) How to enable/disable the interrupts in 8051? Explain with respective SFR.
  - d) Interface 8 LEDs to 8051 and write a program to turn on and off alternate LEDs continuously.
  - e) Explain the modes of operation of Timer in 8051.
- Q.3 Solve any two:** **12**
- a) Write a program for finding even and odd numbers form a given array of 10 elements.
  - b) Write an 8051 program to toggle pin P1.0 continuously every 250ms. Use Timer1, mode1 to create the delay. Assume XTAL= 11.0592MHz.
  - c) Read data through ports 0, 1, and 2, one after other and transfer this data serially, continuously.

**Section – II**

- Q.4 Solve any four:** **16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 0 in PIC 16F877.
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- a) Draw and explain interfacing of 16\*2 LCD to 8051. Write a program to display "HI" on the LCD.
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    - 1) To generate triangular wave and
    - 2) To generate a saw tooth wave.
  - c) Draw and explain interfacing of 16K x 8 Data RAM to 8051. Write a assembly program to transfer 30 bytes starting at 1000h to 2000hh in external Data RAM.

Seat  
No.

**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Wednesday, 11-12-2019  
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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) Of the lower 128 byte of RAM in the 8051, how many bytes are bit addressable?
 

a) eight	b) thirty two
c) sixteen	d) four
- 2) In 8051, serial communication mode 1, the baud rate will be \_\_\_\_\_.
 

a) variable	b) fosc/164
c) fosc/32	d) fosc/12
- 3) Bit address 0x00 and byte address 0x00 are for the \_\_\_\_\_.
 

a) Bit 0 at 0x20 and the byte at 0x00 in the internal RAM
b) Bit 0 at 0x00 and the byte at 0x00 in the internal RAM
c) Bit = 0 in a SFR and the byte = 0x00
d) Bit 0 at 0x20 and the byte at 0x00 in the external RAM
- 4) In 8051 an Timer1 interrupt vector address is of \_\_\_\_\_.
 

a) 000Bh	b) 001Bh
c) 0013h	d) 0023h
- 5) The PIC 16F877 has \_\_\_\_\_ on chip flash program memory.
 

a) 4K x 8 bytes	b) 4K x 14 words
c) 8K x 8 bytes	d) 8K x 14 words
- 6) The PIC 16F877 has \_\_\_\_\_ I/O ports.
 

a) 4	b) 5
c) 6	d) 3
- 7) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
 

a) 8,13	b) 13,8
c) 8,12	d) 12,8
- 8) What is the address of the last location of on-chip flash program memory for PIC 16F877?
 

a) 0FFF h	b) 1FFF h
c) FFFF h	d) 7FFF h
- 9) The instruction "movlw D'200" loads the W register with \_\_\_\_\_.
 

a) 200h	b) C8h
c) 8C h	d) 1100100

- 10) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
- a) Timer 0
  - b) Timer 2
  - c) Timer 1
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- a) PORT 0
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- 12) The ADC0808 has \_\_\_\_\_ resolution.
- a) 4-bit
  - b) 8-bit
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  - c) 46K
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**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
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**MICROCONTROLLERS**

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**Section - I**

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  - b) Write an 8051 program to toggle pin P1.0 continuously every 250ms. Use Timer1, mode1 to create the delay. Assume XTAL= 11.0592MHz.
  - c) Read data through ports 0, 1, and 2, one after other and transfer this data serially, continuously.

**Section – II**

- Q.4 Solve any four:** **16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
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  - c) Draw and explain interfacing of 16K x 8 Data RAM to 8051. Write a assembly program to transfer 30 bytes starting at 1000h to 2000hh in external Data RAM.

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**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
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**MICROCONTROLLERS**

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Max. Marks: 70

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

**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 PIC 16F877 has \_\_\_\_\_ I/O ports.
 

a) 4	b) 5
c) 6	d) 3
- 2) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
 

a) 8,13	b) 13,8
c) 8,12	d) 12,8
- 3) What is the address of the last location of on-chip flash program memory for PIC 16F877?
 

a) 0FFF h	b) 1FFF h
c) FFFF h	d) 7FFF h
- 4) The instruction "movlw D'200" loads the W register with \_\_\_\_\_.
 

a) 200h	b) C8h
c) 8C h	d) 1100100
- 5) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
 

a) Timer 0	b) Timer 2
c) Timer 1	d) Timer 3
- 6) The I/O port that does not have a dual-purpose role is \_\_\_\_\_.
 

a) PORT 0	b) PORT 1
c) PORT 2	d) PORT 3
- 7) The ADC0808 has \_\_\_\_\_ resolution.
 

a) 4-bit	b) 8-bit
c) 16-bit	d) 32-bit
- 8) The total amount of external code memory that can be interfaced to the 8051 is \_\_\_\_\_.
 

a) 32K	b) 16K
c) 46K	d) 64K
- 9) If a period is 0.33 ms between the serial bits, we can transfer \_\_\_\_\_ in one second when SCON sets for mode 2:
 

a) 300 characters	b) 275 characters
c) 30 characters	d) 272 characters

- 10) Of the lower 128 byte of RAM in the 8051, how many bytes are bit addressable?
- |            |               |
|------------|---------------|
| a) eight   | b) thirty two |
| c) sixteen | d) four       |
- 11) In 8051, serial communication mode 1, the baud rate will be \_\_\_\_.
- |                 |                  |
|-----------------|------------------|
| a) variable     | b) $f_{osc}/164$ |
| c) $f_{osc}/32$ | d) $f_{osc}/12$  |
- 12) Bit address 0x00 and byte address 0x00 are for the \_\_\_\_.
- |   |
|---|
| a) Bit 0 at 0x20 and the byte at 0x00 in the internal RAM |
| b) Bit 0 at 0x00 and the byte at 0x00 in the internal RAM |
| c) Bit = 0 in a SFR and the byte = 0x00                   |
| d) Bit 0 at 0x20 and the byte at 0x00 in the external RAM |
- 13) In 8051 an Timer1 interrupt vector address is of \_\_\_\_.
- |          |          |
|----------|----------|
| a) 000Bh | b) 001Bh |
| c) 0013h | d) 0023h |
- 14) The PIC 16F877 has \_\_\_\_ on chip flash program memory.
- |                 |                  |
|-----------------|------------------|
| a) 4K x 8 bytes | b) 4K x 14 words |
| c) 8K x 8 bytes | d) 8K x 14 words |

Seat No.	
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**T.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Wednesday, 11-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data whenever necessary.

**Section - I**

- Q.2 Solve any four:** **16**
- a) Compare RISC and CISC architecture.
  - b) Write a program to add two 16 bit hex numbers.
  - c) How to enable/disable the interrupts in 8051? Explain with respective SFR.
  - d) Interface 8 LEDs to 8051 and write a program to turn on and off alternate LEDs continuously.
  - e) Explain the modes of operation of Timer in 8051.
- Q.3 Solve any two:** **12**
- a) Write a program for finding even and odd numbers form a given array of 10 elements.
  - b) Write an 8051 program to toggle pin P1.0 continuously every 250ms. Use Timer1, mode1 to create the delay. Assume XTAL= 11.0592MHz.
  - c) Read data through ports 0, 1, and 2, one after other and transfer this data serially, continuously.

**Section – II**

- Q.4 Solve any four:** **16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 0 in PIC 16F877.
- Q.5 Solve any two:** **12**
- a) Draw and explain interfacing of 16\*2 LCD to 8051. Write a program to display "HI" on the LCD.
  - b) Draw and explain interfacing of DAC to 8051. Write a program
    - 1) To generate triangular wave and
    - 2) To generate a saw tooth wave.
  - c) Draw and explain interfacing of 16K x 8 Data RAM to 8051. Write a assembly program to transfer 30 bytes starting at 1000h to 2000hh in external Data RAM.



Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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)  $\nabla \times A$  is equal to \_\_\_\_\_.  
 a) H  
 b) B  
 c) J  
 d) zero
- 2) If the direction of Coloumb's Force on a unit charge is  $a_x$ , the direction of electric field is \_\_\_\_\_.  
 a)  $a_y$   
 b)  $-a_x$   
 c)  $a_z$   
 d)  $a_x$
- 3) Potential at all points on the surface of a conductor is \_\_\_\_\_.  
 a) same  
 b) infinity  
 c) not same  
 d) zero
- 4) If pair of +ve & -ve charges of 1C separated by distance  $2\mu\text{m}$  then the magnitude of dipole moment is \_\_\_\_\_.  
 a)  $1\text{C} - \mu\text{m}$   
 b)  $2\text{C} - \text{m}$   
 c)  $2\text{C} - \mu\text{m}$   
 d)  $0.5\text{C} - \mu\text{m}$
- 5) The charge density of  $10\text{ nC}\cdot\text{m}^2$  is distributed on a plane  $z = -5\text{m}$ , the electric field intensity at origin is \_\_\_\_\_.  
 a)  $180\pi a_z$   
 b)  $-180\pi a_z$   
 c)  $-10\pi a_z$   
 d)  $-360\pi a_z$
- 6) If  $E$  is a vector then  $\nabla \cdot \nabla \times E$  is \_\_\_\_\_.  
 a) 1  
 b) 0  
 c)  $\infty$   
 d) doesn't exist
- 7) A point is obtained by intersection of \_\_\_\_\_ in cylindrical co-ordinates.  
 a) 3 planes  
 b) 2 planes and circle  
 c) plane, circle and a cone  
 d) None of these
- 8) Potential due to charge at a point situated at  $\infty$  is \_\_\_\_\_.  
 a)  $\infty$   
 b) zero  
 c) finite  
 d) 1
- 9) For transformation from the Cartesian coordinate system to Spherical coordinate system, should be equal to \_\_\_\_\_.  
 a)  $\cos \theta$   
 b)  $-\cos \theta$   
 c)  $\sin \theta$   
 d)  $-\sin \theta$

- 10) Voltage reflection coefficient is the ratio of \_\_\_\_\_ wave to \_\_\_\_\_ wave.
- a) Incident, reflected                      b) Reflected, incident  
c) Incident, absorbed                      d) Absorbed, incident
- 11) The  $\alpha$  is known as \_\_\_\_\_.
- a) Amplitude constant                      b) Attenuation constant  
c) Absolute constant                      d) None
- 12) If antenna directivity and antenna gain are equal, then antenna efficiency is \_\_\_\_\_ %.
- a) 20    b) 50  
c) 75    d) 100
- 13) For static magnetic field Maxwell's curl equation is given by \_\_\_\_\_.
- a)  $\nabla \cdot \vec{B} = \mu_0 \vec{J}$                       b)  $\nabla \times \vec{B} = \mu_0 \vec{J}$   
c)  $\nabla \times \vec{B} = 0$                               d)  $\nabla \times \vec{B} = \mu_0 / \vec{J}$
- 14) In a free space which of the following relations hold good?
- a)  $\nabla \times D = g$                               b)  $\nabla \cdot D = g$   
c)  $\nabla \times D = 0$                               d)  $\nabla \cdot D = 0$

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

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

- State and Explain Culombs Law.
- Uniform charge distribution  $\rho_1 = 20 \text{ n c/m}$  is distributed along  $x=2\text{m}$ ,  $y=-4\text{m}$ . Find  $E$  at  $(-2, 1, 4)$ .
- Prove That  $E = -\nabla V$ .
- Find the area of circular disc with radius 2m and circumference of circle with radius 3m.
- Convert point  $A(3,4,5)$  in cylindrical and spherical form.

**Q.3 Answer any two questions. 12**

- State and derive point form of gauss's law and state Divergence theorem.
- Derive the expression for  $H$  due to finite length filament placed along  $z$ -axis from  $z = z_1$  to  $z_2$ .
- Given  $\vec{E} = -8xy\vec{a}_x - 4x^2\vec{a}_y + \vec{a}_z v/m$  find work done in moving 6C charge from point  $A(1,8,5)$  to  $B(2,18,6)$  along path  $y = 3x + 2$  and  $z = x + 4$ .

**Section – II**

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

- Write a note on skin depth.
- Show that.  

$$Z_0 = \sqrt{Z_{sc}Z_{oc}}$$
- A signal of 10V is applied to a  $50 \Omega$  coaxial transmission line terminated in load  $200 \Omega$ . Find  $\rho_v$  & reflected voltage.
- Define Directive Gain and Directivity of antenna.
- Explain Antenna Efficiency and give its significance.

**Q.5 Answer any two questions. 12**

- Derive the expression for radiation resistance of short dipole antenna.
- A uniform transmission line has the constants  $R= 2 \Omega/m$ ,  $L=8\text{n H/m}$ ,  $C=0.23\text{pF/m}$  and  $G=0.5 \text{ m Mho/m}$ . At 1GHz determine:
  - $Z_0$
  - Propagation constant
- State and derive Poynting Theorem.

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Potential due to charge at a point situated at  $\infty$  is \_\_\_\_\_.
  - a)  $\infty$
  - b) zero
  - c) finite
  - d) 1
- 2) For transformation from the Cartesian coordinate system to Spherical coordinate system, should be equal to \_\_\_\_\_.
  - a)  $\cos \theta$
  - b)  $-\cos \theta$
  - c)  $\sin \theta$
  - d)  $-\sin \theta$
- 3) Voltage reflection coefficient is the ratio of \_\_\_\_\_ wave to \_\_\_\_\_ wave.
  - a) Incident, reflected
  - b) Reflected, incident
  - c) Incident, absorbed
  - d) Absorbed, incident
- 4) The  $\alpha$  is known as \_\_\_\_\_.
  - a) Amplitude constant
  - b) Attenuation constant
  - c) Absolute constant
  - d) None
- 5) If antenna directivity and antenna gain are equal, then antenna efficiency is \_\_\_\_\_ %.
  - a) 20
  - b) 50
  - c) 75
  - d) 100
- 6) For static magnetic field Maxwell's curl equation is given by \_\_\_\_\_.
  - a)  $\nabla \cdot \vec{B} = \mu_0 \vec{J}$
  - b)  $\nabla \times \vec{B} = \mu_0 \vec{J}$
  - c)  $\nabla \times \vec{B} = 0$
  - d)  $\nabla \times \vec{B} = \mu_0 / \vec{J}$
- 7) In a free space which of the following relations hold good?
  - a)  $\nabla \times D = g$
  - b)  $\nabla \cdot D = g$
  - c)  $\nabla \times D = 0$
  - d)  $\nabla \cdot D = 0$
- 8)  $\nabla \times A$  is equal to \_\_\_\_\_.
  - a) H
  - b) B
  - c) J
  - d) zero
- 9) If the direction of Coloumb's Force on a unit charge is  $a_x$ , the direction of electric field is \_\_\_\_\_.
  - a)  $a_y$
  - b)  $-a_x$
  - c)  $a_z$
  - d)  $a_x$

- 10) Potential at all points on the surface of a conductor is \_\_\_\_\_.  
a) same                                      b) infinity  
c) not same                                    d) zero
- 11) If pair of +ve & -ve charges of 1C separated by distance  $2\mu\text{m}$  then the magnitude of dipole moment is \_\_\_\_\_.  
a)  $1\text{C} - \mu\text{m}$                                   b)  $2\text{C} - \text{m}$   
c)  $2\text{C} - \mu\text{m}$                                   d)  $0.5\text{C} - \mu\text{m}$
- 12) The charge density of  $10\text{ nC}\cdot\text{m}^2$  is distributed on a plane  $z = -5\text{m}$ , the electric field intensity at origin is \_\_\_\_\_.  
a)  $180\pi a_z$                                     b)  $-180\pi a_z$   
c)  $-10\pi a_z$                                     d)  $-360\pi a_z$
- 13) If  $E$  is a vector then  $\nabla \cdot \nabla \times E$  is \_\_\_\_\_.  
a) 1    b) 0  
c)  $\infty$     d) doesn't exist
- 14) A point is obtained by intersection of \_\_\_\_\_ in cylindrical co-ordinates.  
a) 3 planes                                      b) 2 planes and circle  
c) plane, circle and a cone                  d) None of these

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

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

- a) State and Explain Culombs Law.
- b) Uniform charge distribution  $\rho_1 = 20 \text{ n c/m}$  is distributed along  $x=2\text{m}$ ,  $y=-4\text{m}$ . Find  $E$  at  $(-2, 1, 4)$ .
- c) Prove That  $E = -\nabla V$ .
- d) Find the area of circular disc with radius  $2\text{m}$  and circumference of circle with radius  $3\text{m}$ .
- e) Convert point  $A(3,4,5)$  in cylindrical and spherical form.

**Q.3 Answer any two questions. 12**

- a) State and derive point form of gauss's law and state Divergence theorem.
- b) Derive the expression for  $H$  due to finite length filament placed along  $z$ -axis from  $z = z_1$  to  $z_2$ .
- c) Given  $\vec{E} = -8xy\vec{a}_x - 4x^2\vec{a}_y + \vec{a}_z v/m$  find work done in moving  $6\text{C}$  charge from point  $A(1,8,5)$  to  $B(2,18,6)$  along path  $y = 3x + 2$  and  $z = x + 4$ .

**Section – II**

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

- a) Write a note on skin depth.
- b) Show that.  

$$Z_0 = \sqrt{Z_{sc}Z_{oc}}$$
- c) A signal of  $10\text{V}$  is applied to a  $50 \Omega$  coaxial transmission line terminated in load  $200 \Omega$ . Find  $\rho_v$  & reflected voltage.
- d) Define Directive Gain and Directivity of antenna.
- e) Explain Antenna Efficiency and give its significance.

**Q.5 Answer any two questions. 12**

- a) Derive the expression for radiation resistance of short dipole antenna.
- b) A uniform transmission line has the constants  $R = 2 \Omega/\text{m}$ ,  $L = 8\text{n H/m}$ ,  $C = 0.23\text{pF/m}$  and  $G = 0.5 \text{ m Mho/m}$ . At  $1\text{GHz}$  determine:
  - 1)  $Z_0$
  - 2) Propagation constant
- c) State and derive Poynting Theorem.

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 charge density of  $10 \text{ nC-m}^2$  is distributed on a plane  $z = -5\text{m}$ , the electric field intensity at origin is \_\_\_\_\_.
 

a) $180 \pi a_z$	b) $-180 \pi a_z$
c) $-10 \pi a_z$	d) $-360 \pi a_z$
- 2) If  $E$  is a vector then  $\nabla \cdot \nabla \times E$  is \_\_\_\_\_.
 

a) 1	b) 0
c) $\infty$	d) doesn't exist
- 3) A point is obtained by intersection of \_\_\_\_\_ in cylindrical co-ordinates.
 

a) 3 planes	b) 2 planes and circle
c) plane, circle and a cone	d) None of these
- 4) Potential due to charge at a point situated at  $\infty$  is \_\_\_\_\_.
 

a) $\infty$	b) zero
c) Finite	d) 1
- 5) For transformation from the Cartesian coordinate system to Spherical coordinate system, should be equal to \_\_\_\_\_.
 

a) $\cos \theta$	b) $-\cos \theta$
c) $\sin \theta$	d) $-\sin \theta$
- 6) Voltage reflection coefficient is the ratio of \_\_\_\_\_ wave to \_\_\_\_\_ wave.
 

a) Incident, reflected	b) Reflected, incident
c) Incident, absorbed	d) Absorbed, incident
- 7) The  $\alpha$  is known as \_\_\_\_\_.
 

a) Amplitude constant	b) Attenuation constant
c) Absolute constant	d) None
- 8) If antenna directivity and antenna gain are equal, then antenna efficiency is \_\_\_\_\_ %.
 

a) 20	b) 50
c) 75	d) 100
- 9) For static magnetic field Maxwell's curl equation is given by \_\_\_\_\_.
 

a) $\nabla \cdot \vec{B} = \mu_0 \vec{J}$	b) $\nabla \times \vec{B} = \mu_0 \vec{J}$
c) $\nabla \times \vec{B} = 0$	d) $\nabla \times \vec{B} = \mu_0 / \vec{J}$

- 10) In a free space which of the following relations hold good?
- a)  $\nabla \times D = \rho$
  - b)  $\nabla \cdot D = \rho$
  - c)  $\nabla \times D = 0$
  - d)  $\nabla \cdot D = 0$
- 11)  $\nabla \times A$  is equal to \_\_\_\_.
- a) H
  - b) B
  - c) J
  - d) zero
- 12) If the direction of Coloumb's Force on a unit charge is  $a_x$ , the direction of electric field is \_\_\_\_.
- a)  $a_y$
  - b)  $-a_x$
  - c)  $a_z$
  - d)  $a_x$
- 13) Potential at all points on the surface of a conductor is \_\_\_\_.
- a) same
  - b) infinity
  - c) not same
  - d) zero
- 14) If pair of +ve & -ve charges of 1C separated by distance  $2\mu\text{m}$  then the magnitude of dipole moment is \_\_\_\_.
- a)  $1\text{C} - \mu\text{m}$
  - b)  $2\text{C} - \text{m}$
  - c)  $2\text{C} - \mu\text{m}$
  - d)  $0.5\text{C} - \mu\text{m}$



Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

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

- State and Explain Culombs Law.
- Uniform charge distribution  $\rho_1 = 20 \text{ n c/m}$  is distributed along  $x=2\text{m}$ ,  $y=-4\text{m}$ . Find  $E$  at  $(-2, 1, 4)$ .
- Prove That  $E = -\nabla V$ .
- Find the area of circular disc with radius  $2\text{m}$  and circumference of circle with radius  $3\text{m}$ .
- Convert point  $A(3,4,5)$  in cylindrical and spherical form.

**Q.3 Answer any two questions. 12**

- State and derive point form of gauss's law and state Divergence theorem.
- Derive the expression for  $H$  due to finite length filament placed along  $z$ -axis from  $z = z_1$  to  $z_2$ .
- Given  $\vec{E} = -8xy\vec{a}_x - 4x^2\vec{a}_y + \vec{a}_z v/m$  find work done in moving  $6\text{C}$  charge from point  $A(1,8,5)$  to  $B(2,18,6)$  along path  $y = 3x + 2$  and  $z = x + 4$ .

**Section – II**

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

- Write a note on skin depth.
- Show that.  

$$Z_0 = \sqrt{Z_{sc}Z_{oc}}$$
- A signal of  $10\text{V}$  is applied to a  $50 \Omega$  coaxial transmission line terminated in load  $200 \Omega$ . Find  $\rho_v$  & reflected voltage.
- Define Directive Gain and Directivity of antenna.
- Explain Antenna Efficiency and give its significance.

**Q.5 Answer any two questions. 12**

- Derive the expression for radiation resistance of short dipole antenna.
- A uniform transmission line has the constants  $R= 2 \Omega/\text{m}$ ,  $L=8\text{n H/m}$ ,  $C=0.23\text{pF/m}$  and  $G=0.5 \text{ m Mho/m}$ . At  $1\text{GHz}$  determine:
  - $Z_0$
  - Propagation constant
- State and derive Poynting Theorem.

Seat  
No.

**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Voltage reflection coefficient is the ratio of \_\_\_\_\_ wave to \_\_\_\_\_ wave.
  - a) Incident, reflected
  - b) Reflected, incident
  - c) Incident, absorbed
  - d) Absorbed, incident
- 2) The  $\alpha$  is known as \_\_\_\_\_.
  - a) Amplitude constant
  - b) Attenuation constant
  - c) Absolute constant
  - d) None
- 3) If antenna directivity and antenna gain are equal, then antenna efficiency is \_\_\_\_\_ %.
  - a) 20
  - b) 50
  - c) 75
  - d) 100
- 4) For static magnetic field Maxwell's curl equation is given by \_\_\_\_\_.
  - a)  $\nabla \cdot \vec{B} = \mu_0 \vec{J}$
  - b)  $\nabla \times \vec{B} = \mu_0 \vec{J}$
  - c)  $\nabla \times \vec{B} = 0$
  - d)  $\nabla \times \vec{B} = \mu_0 / \vec{J}$
- 5) In a free space which of the following relations hold good?
  - a)  $\nabla \times D = g$
  - b)  $\nabla \cdot D = g$
  - c)  $\nabla \times D = 0$
  - d)  $\nabla \cdot D = 0$
- 6)  $\nabla \times A$  is equal to \_\_\_\_\_.
  - a) H
  - b) B
  - c) J
  - d) zero
- 7) If the direction of Coloumb's Force on a unit charge is  $a_x$ , the direction of electric field is \_\_\_\_\_.
  - a)  $a_y$
  - b)  $-a_x$
  - c)  $a_z$
  - d)  $a_x$
- 8) Potential at all points on the surface of a conductor is \_\_\_\_\_.
  - a) same
  - b) infinity
  - c) not same
  - d) zero
- 9) If pair of +ve & -ve charges of 1C separated by distance  $2\mu\text{m}$  then the magnitude of dipole moment is \_\_\_\_\_.
  - a)  $1\text{C} - \mu\text{m}$
  - b)  $2\text{C} - \text{m}$
  - c)  $2\text{C} - \mu\text{m}$
  - d)  $0.5\text{C} - \mu\text{m}$



Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

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

- a) State and Explain Culombs Law.
- b) Uniform charge distribution  $\rho_1 = 20 \text{ n c/m}$  is distributed along  $x=2\text{m}$ ,  $y=-4\text{m}$ . Find  $E$  at  $(-2, 1, 4)$ .
- c) Prove That  $E = -\nabla V$ .
- d) Find the area of circular disc with radius 2m and circumference of circle with radius 3m.
- e) Convert point A(3,4,5) in cylindrical and spherical form.

**Q.3 Answer any two questions. 12**

- a) State and derive point form of gauss's law and state Divergence theorem.
- b) Derive the expression for H due to finite length filament placed along z-axis from  $z = z_1$  to  $z_2$ .
- c) Given  $\vec{E} = -8xy\vec{a}_x - 4x^2\vec{a}_y + \vec{a}_z v/m$  find work done in moving 6C charge from point A(1,8,5) to B(2,18,6) along path  $y = 3x + 2$  and  $z = x + 4$ .

**Section – II**

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

- a) Write a note on skin depth.
- b) Show that.  

$$Z_0 = \sqrt{Z_{sc}Z_{oc}}$$
- c) A signal of 10V is applied to a  $50 \Omega$  coaxial transmission line terminated in load  $200 \Omega$ . Find  $\rho_v$  & reflected voltage.
- d) Define Directive Gain and Directivity of antenna.
- e) Explain Antenna Efficiency and give its significance.

**Q.5 Answer any two questions. 12**

- a) Derive the expression for radiation resistance of short dipole antenna.
- b) A uniform transmission line has the constants  $R= 2 \Omega/m$ ,  $L=8\text{n H/m}$ ,  $C=0.23\text{pF/m}$  and  $G=0.5 \text{ m Mho/m}$ . At 1GHz determine:
  - 1)  $Z_0$
  - 2) Propagation constant
- c) State and derive Poynting Theorem.

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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
2) Figures to the right indicate full marks.  
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) Matched filter may be optimally used only for \_\_\_\_\_.  
a) Gaussian noise                      b) Transit time noise  
c) Flicker                                d) All of the above
- 2) In uniform quantization process \_\_\_\_\_.  
a) The step size remains same  
b) Step size varies according to the values of the input signal  
c) The quantizer has linear characteristics  
d) Both a and c are correct
- 3) The modulation techniques used to convert analog signal into digital signal are \_\_\_\_\_.  
a) Pulse code modulation              b) Delta modulation  
c) Adaptive delta modulation        d) All of the above
- 4) One of the disadvantages of PCM is \_\_\_\_\_.  
a) It requires large bandwidth        b) Very high noise  
c) Cannot be decoded easily        d) All of the above
- 5) The channel capacity according to Shannon's equation is \_\_\_\_\_.  
a) Maximum error free communication  
b) Defined for optimum system  
c) Information transmitted  
d) All of the above
- 6) The information rate R for given average information H= 2.0 for analog signal band limited to B Hz is \_\_\_\_\_.  
a) 8 B bits/sec                            b) 4 B bits/sec  
c) 2 B bits/sec                            d) 16 B bits/sec
- 7) For decoding in convolution coding, in a code tree, \_\_\_\_\_.  
a) Diverge upward when a bit is 0 and diverge downward when the bit is 1  
b) Diverge downward when a bit is 0 and diverge upward when the bit is 1  
c) Diverge left when a bit is 0 and diverge right when the bit is 1  
d) Diverge right when a bit is 0 and diverge left when the bit is 1
- 8) Parity check bit coding is used for \_\_\_\_\_.  
a) Error correction                      b) Error detection  
c) Error correction and detection    d) None of the above

- 9) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.
- a) Higher
  - b) Lower
  - c) Same
  - d) Not predictable
- 10) 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
- 11) The data rate of QPSK is \_\_\_\_\_ of BPSK.
- a) Thrice
  - b) Four times
  - c) Twice
  - d) Same
- 12) One of the disadvantages of PCM is \_\_\_\_\_.
- a) It requires large bandwidth
  - b) Very high noise
  - c) cannot be decoded easily
  - d) All of the above
- 13) The sequence of operations in which PCM is done is \_\_\_\_\_.
- a) Sampling, quantizing, encoding
  - b) Quantizing, encoding, sampling
  - c) Quantizing, sampling, encoding
  - d) None of the above
- 14) Minimum shift keying is similar to \_\_\_\_\_.
- a) Continuous phase frequency shift keying
  - b) Binary phase shift keying
  - c) Binary frequency shift keying
  - d) QPSK

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- Compare Analog Communication and Digital Communication.
  - Explain PPM using IC555.
  - Define the Information Theory and Mutual information.
  - Why companding is necessary?
  - Determine the Nyquist sampling rate & sampling interval for the following signal

$$x(t) = 6\cos(50\pi t) + 20\sin(300\pi t) - 10\cos(100\pi t)$$

- Q.3 Attempt any two of the following questions. 12**
- Compare PCM, DPCM, DM and ADM.
  - Derive the expression for condition of maximum entropy.
  - A DMS X has five symbols  $x_1, x_2, x_3, x_4$  and  $x_5$  with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively.
    - Construct a Shannon Fano code for X and calculate the efficiency of the code.
    - Repeat for Huffman code and compare the result.

**Section -II**

- Q.4 Attempt any four of the following questions. 16**
- What is coherent and non-coherent detection?
  - Explain Matched Filter BPSK Detector.
  - Explain convolution code with Example.
  - In an  $(n, k)$  linear block code, how many code words will be there? Justify your answer.
  - With suitable example explain baseband modulation and band pass modulation.

- Q.5 Attempt any two of the following questions. 12**
- With suitable waveforms explain QPSK & OQPSK.
  - For a (7,4) code the generator matrix G is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

- Find the code Vector for Message 1 1 0 1
  - Find the parity Check Matrix
- c) Explain frame synchronization.**

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) Parity check bit coding is used for \_\_\_\_\_.  
 a) Error correction                      b) Error detection  
 c) Error correction and detection      d) None of the above
- 2) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.  
 a) Higher                                      b) Lower  
 c) Same                                         d) Not predictable
- 3) 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
- 4) The data rate of QPSK is \_\_\_\_\_ of BPSK.  
 a) Thrice  
 b) Four times  
 c) Twice  
 d) Same
- 5) One of the disadvantages of PCM is \_\_\_\_\_.  
 a) It requires large bandwidth              b) Very high noise  
 c) cannot be decoded easily                 d) All of the above
- 6) The sequence of operations in which PCM is done is \_\_\_\_\_.  
 a) Sampling, quantizing, encoding  
 b) Quantizing, encoding, sampling  
 c) Quantizing, sampling, encoding  
 d) None of the above
- 7) Minimum shift keying is similar to \_\_\_\_\_.  
 a) Continuous phase frequency shift keying  
 b) Binary phase shift keying  
 c) Binary frequency shift keying  
 d) QPSK
- 8) Matched filter may be optimally used only for \_\_\_\_\_.  
 a) Gaussian noise                              b) Transit time noise  
 c) Flicker                                         d) All of the above



- 9) In uniform quantization process \_\_\_\_\_.  
a) The step size remains same  
b) Step size varies according to the values of the input signal  
c) The quantizer has linear characteristics  
d) Both a and c are correct
- 10) The modulation techniques used to convert analog signal into digital signal are \_\_\_\_\_.  
a) Pulse code modulation                      b) Delta modulation  
c) Adaptive delta modulation                d) All of the above
- 11) One of the disadvantages of PCM is \_\_\_\_\_.  
a) It requires large bandwidth                b) Very high noise  
c) Cannot be decoded easily                 d) All of the above
- 12) The channel capacity according to Shannon's equation is \_\_\_\_\_.  
a) Maximum error free communication  
b) Defined for optimum system  
c) Information transmitted  
d) All of the above
- 13) The information rate  $R$  for given average information  $H= 2.0$  for analog signal band limited to  $B$  Hz is \_\_\_\_\_.  
a)  $8 B$  bits/sec                                      b)  $4 B$  bits/sec  
c)  $2 B$  bits/sec                                      d)  $16 B$  bits/sec
- 14) For decoding in convolution coding, in a code tree, \_\_\_\_\_.  
a) Diverge upward when a bit is 0 and diverge downward when the bit is 1  
b) Diverge downward when a bit is 0 and diverge upward when the bit is 1  
c) Diverge left when a bit is 0 and diverge right when the bit is 1  
d) Diverge right when a bit is 0 and diverge left when the bit is 1

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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) Compare Analog Communication and Digital Communication.
- b) Explain PPM using IC555.
- c) Define the Information Theory and Mutual information.
- d) Why companding is necessary?
- e) Determine the Nyquist sampling rate & sampling interval for the following signal

$$x(t) = 6\cos(50\pi t) + 20\sin(300\pi t) - 10\cos(100\pi t)$$

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

- a) Compare PCM, DPCM, DM and ADM.
- b) Derive the expression for condition of maximum entropy.
- c) A DMS X has five symbols  $x_1, x_2, x_3, x_4$  and  $x_5$  with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively.
  - i) Construct a Shannon Fano code for X and calculate the efficiency of the code.
  - ii) Repeat for Huffman code and compare the result.

**Section -II**

**Q.4 Attempt any four of the following questions. 16**

- a) What is coherent and non-coherent detection?
- b) Explain Matched Filter BPSK Detector.
- c) Explain convolution code with Example.
- d) In an  $(n, k)$  linear block code, how many code words will be there? Justify your answer.
- e) With suitable example explain baseband modulation and band pass modulation.

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- a) With suitable waveforms explain QPSK & OQPSK.
- b) For a  $(7, 4)$  code the generator matrix G is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

- i) Find the code Vector for Message 1 1 0 1
  - ii) Find the parity Check Matrix
- c) Explain frame synchronization.

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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 channel capacity according to Shannon's equation is \_\_\_\_\_.
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  - d) All of the above
- 2) The information rate R for given average information H= 2.0 for analog signal band limited to B Hz is \_\_\_\_\_.
 

a) 8 B bits/sec	b) 4 B bits/sec
c) 2 B bits/sec	d) 16 B bits/sec
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  - c) Diverge left when a bit is 0 and diverge right when the bit is 1
  - d) Diverge right when a bit is 0 and diverge left when the bit is 1
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a) Error correction	b) Error detection
c) Error correction and detection	d) None of the above
- 5) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.
 

a) Higher	b) Lower
c) Same	d) Not predictable
- 6) QPSK is a modulation scheme where each symbol consists of \_\_\_\_\_.
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  - b) 2 bits
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  - b) Four times
  - c) Twice
  - d) Same
- 8) One of the disadvantages of PCM is \_\_\_\_\_.
 

a) It requires large bandwidth	b) Very high noise
c) cannot be decoded easily	d) All of the above

- 9) The sequence of operations in which PCM is done is \_\_\_\_\_.  
a) Sampling, quantizing, encoding  
b) Quantizing, encoding, sampling  
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d) None of the above
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a) Continuous phase frequency shift keying  
b) Binary phase shift keying  
c) Binary frequency shift keying  
d) QPSK
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a) The step size remains same  
b) Step size varies according to the values of the input signal  
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Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- Compare Analog Communication and Digital Communication.
  - Explain PPM using IC555.
  - Define the Information Theory and Mutual information.
  - Why companding is necessary?
  - Determine the Nyquist sampling rate & sampling interval for the following signal

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- Q.3 Attempt any two of the following questions. 12**
- Compare PCM, DPCM, DM and ADM.
  - Derive the expression for condition of maximum entropy.
  - A DMS X has five symbols  $x_1, x_2, x_3, x_4$  and  $x_5$  with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively.
    - Construct a Shannon Fano code for X and calculate the efficiency of the code.
    - Repeat for Huffman code and compare the result.

**Section –II**

- Q.4 Attempt any four of the following questions. 16**
- What is coherent and non-coherent detection?
  - Explain Matched Filter BPSK Detector.
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  - In an  $(n, k)$  linear block code, how many code words will be there? Justify your answer.
  - With suitable example explain baseband modulation and band pass modulation.

- Q.5 Attempt any two of the following questions. 12**
- With suitable waveforms explain QPSK & OQPSK.
  - For a  $(7,4)$  code the generator matrix G is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

- Find the code Vector for Message 1 1 0 1
  - Find the parity Check Matrix
- c) Explain frame synchronization.**

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) 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
- 2) The data rate of QPSK is \_\_\_\_\_ of BPSK.
  - a) Thrice
  - b) Four times
  - c) Twice
  - d) Same
- 3) One of the disadvantages of PCM is \_\_\_\_\_.
 

a) It requires large bandwidth	b) Very high noise
c) cannot be decoded easily	d) All of the above
- 4) The sequence of operations in which PCM is done is \_\_\_\_\_.
  - a) Sampling, quantizing, encoding
  - b) Quantizing, encoding, sampling
  - c) Quantizing, sampling, encoding
  - d) None of the above
- 5) Minimum shift keying is similar to \_\_\_\_\_.
  - a) Continuous phase frequency shift keying
  - b) Binary phase shift keying
  - c) Binary frequency shift keying
  - d) QPSK
- 6) Matched filter may be optimally used only for \_\_\_\_\_.
 

a) Gaussian noise	b) Transit time noise
c) Flicker	d) All of the above
- 7) In uniform quantization process \_\_\_\_\_.
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  - c) The quantizer has linear characteristics
  - d) Both a and c are correct

- 8) The modulation techniques used to convert analog signal into digital signal are \_\_\_\_\_.
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c) Adaptive delta modulation                d) All of the above
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- a) Maximum error free communication  
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c) Information transmitted  
d) All of the above
- 11) The information rate  $R$  for given average information  $H= 2.0$  for analog signal band limited to  $B$  Hz is \_\_\_\_\_.
- a)  $8 B$  bits/sec                                      b)  $4 B$  bits/sec  
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- 12) For decoding in convolution coding, in a code tree, \_\_\_\_\_.
- a) Diverge upward when a bit is 0 and diverge downward when the bit is 1  
b) Diverge downward when a bit is 0 and diverge upward when the bit is 1  
c) Diverge left when a bit is 0 and diverge right when the bit is 1  
d) Diverge right when a bit is 0 and diverge left when the bit is 1
- 13) Parity check bit coding is used for \_\_\_\_\_.
- a) Error correction                                b) Error detection  
c) Error correction and detection            d) None of the above
- 14) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.
- a) Higher    b) Lower  
c) Same    d) Not predictable

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- Compare Analog Communication and Digital Communication.
  - Explain PPM using IC555.
  - Define the Information Theory and Mutual information.
  - Why companding is necessary?
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- Compare PCM, DPCM, DM and ADM.
  - Derive the expression for condition of maximum entropy.
  - A DMS X has five symbols  $x_1, x_2, x_3, x_4$  and  $x_5$  with 0.4, 0.19, 0.16, 0.15 and 0.1 respectively.
    - Construct a Shannon Fano code for X and calculate the efficiency of the code.
    - Repeat for Huffman code and compare the result.

**Section -II**

- Q.4 Attempt any four of the following questions. 16**
- What is coherent and non-coherent detection?
  - Explain Matched Filter BPSK Detector.
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  - In an  $(n, k)$  linear block code, how many code words will be there? Justify your answer.
  - With suitable example explain baseband modulation and band pass modulation.

- Q.5 Attempt any two of the following questions. 12**
- With suitable waveforms explain QPSK & OQPSK.
  - For a (7,4) code the generator matrix G is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

- Find the code Vector for Message 1 1 0 1
  - Find the parity Check Matrix
- c) Explain frame synchronization.**



Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
EMBEDDED SYSTEMS**

Day & Date: Monday, 25-11-2019  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
2) Figures to the right indicate full marks.  
3) 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) \_\_\_\_\_ mode has more banked registers as compared to other modes.
  - a) IRQ
  - b) FIQ
  - c) Supervisor
  - d) Abort
- 2) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P0.0 to P0.15.
  - a) PINSEL2
  - b) IODIR2
  - c) PINSEL0
  - d) PINSEL1
- 3) The CPSR register contains \_\_\_\_\_.
  - a) Condition code flags
  - b) Interrupt disable bits
  - c) Current processor mode
  - d) All of the above
- 4) To force logic '1' on port pin P1.24, \_\_\_\_\_ register is used in LPC2148.
  - a) IOSET0
  - b) IOCLR0
  - c) IODIR0
  - d) IOSET1
- 5) The \_\_\_\_\_ directive aligns the current location to a specified boundary by padding with zeros.
  - a) ALIGN
  - b) AREA
  - c) END
  - d) DCD
- 6) \_\_\_\_\_ vector is location of the first instruction executed by the processor when powered on.
  - a) Undefined
  - b) Abort
  - c) Reset
  - d) Data abort
- 7) If the register R2 contains the hexadecimal number A3A33838, the hexadecimal value of the number stored in register R4 after executing ARM instruction MVN R4, R2 will be \_\_\_\_\_.
  - a) 3A3A8383
  - b) 5353C7C7
  - c) 5C5CC7C7
  - d) None of the above
- 8) The \_\_\_\_\_ is the part of the kernel responsible for determining which task will run next.
  - a) Scheduler
  - b) Semaphore
  - c) Mailbox
  - d) Mutex

- 9) Pipes in RTOS are entirely \_\_\_\_\_ oriented.
- a) Byte
  - b) Bit
  - c) Bit & Byte
  - d) none
- 10) Inter Process Communication can be done through \_\_\_\_\_.
- a) Mailbox
  - b) Messages Queue
  - c) Both a and b
  - d) Trap
- 11) 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
- 12) A binary semaphore \_\_\_\_\_.
- a) is essential to binary computers
  - b) has the values one or zero
  - c) is used only for synchronization
  - d) is used only for mutual exclusion
- 13) Execution time of all  $\mu$ C/OS-II functions and services are \_\_\_\_\_.
- a) Deterministic
  - b) Non deterministic
  - c) Both a & b
  - d) None of the above
- 14)  $\mu$ cos-II and most commercial real-time kernels are \_\_\_\_\_ because system responsiveness is important.
- a) Selective preemption
  - b) Non-preemptive
  - c) Preemptive
  - d) None of above

<b>Seat No.</b>	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.  
 3) Assume suitable data if necessary and state it clearly.

**Section – I**

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

- a) Write an ARM ASM code to find smallest number from a series of 16 bit numbers.
- b) Explain LDR and STR data transfer instructions with examples.
- c) Interface one LED to LPC2148 port pin P0.10. Write an embedded C program to blink it continuously.
- d) Sketch and explain ARM core data flow model.
- e) List and elaborate the privileged and non-privileged modes of operation in ARM7 processor.

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

- a) What is pipeline? Explain the effect of pipeline on program execution with example.
- b) List and elaborate the group of registers available in Pin Connect block of LPC2148.
- c) Interface a stepper motor with LPC2148 for the following specifications
  - i) The motor is connected to port pins P0.10, P0.11, P0.12, and P0.13.
  - ii) Rotate motor in anti-clockwise direction

**Section – II**

**Q.4 Attempt any four of the following question. 16**

- a) Define the context Switching. Explain with timing diagram the steps involved in  $\mu$ cos-II context switching?
- b) Draw & discuss block diagram of Smart card.
- c) Define priority inheritance also elaborates with example.
- d) Discuss shared data problem and methods to solve it.
- e) Discuss different kernel services in  $\mu$ cos-II

**Q.5 Attempt any two of the following question. 12**

- a) Explain the task state diagram for  $\mu$ cos-II. State various functions related to task.
- b) What is scheduling? Explain Non Preemptive scheduling methods in RTOS.
- c) What is semaphore? Explain how semaphore can be used for Resource synchronization in RTOS.

Seat No.	
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Set	Q
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- 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) The \_\_\_\_\_ is the part of the kernel responsible for determining which task will run next.
  - a) Scheduler
  - b) Semaphore
  - c) Mailbox
  - d) Mutex
- 2) Pipes in RTOS are entirely \_\_\_\_\_ oriented.
  - a) Byte
  - b) Bit
  - c) Bit & Byte
  - d) none
- 3) Inter Process Communication can be done through \_\_\_\_\_.
  - a) Mailbox
  - b) Messages Queue
  - c) Both a and b
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- 4) The strategy of allowing processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_.
  - a) preemptive scheduling
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- 5) A binary semaphore \_\_\_\_\_.
  - a) is essential to binary computers
  - b) has the values one or zero
  - c) is used only for synchronization
  - d) is used only for mutual exclusion
- 6) Execution time of all  $\mu$ C/OS-II functions and services are \_\_\_\_\_.
  - a) Deterministic
  - b) Non deterministic
  - c) Both a & b
  - d) None of the above
- 7)  $\mu$ cos-II and most commercial real-time kernels are \_\_\_\_\_ because system responsiveness is important.
  - a) Selective preemption
  - b) Non-preemptive
  - c) Preemptive
  - d) None of above
- 8) \_\_\_\_\_ mode has more banked registers as compared to other modes.
  - a) IRQ
  - b) FIQ
  - c) Supervisor
  - d) Abort

- 9) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P0.0 to P0.15.
- |            |            |
|------------|------------|
| a) PINSEL2 | b) IODIR2  |
| c) PINSEL0 | d) PINSEL1 |
- 10) The CPSR register contains \_\_\_\_\_.
- |                           |                           |
|---------------------------|---------------------------|
| a) Condition code flags   | b) Interrupt disable bits |
| c) Current processor mode | d) All of the above       |
- 11) To force logic '1' on port pin P1.24, \_\_\_\_\_ register is used in LPC2148.
- |           |           |
|-----------|-----------|
| a) IOSET0 | b) IOCLR0 |
| c) IODIR0 | d) IOSET1 |
- 12) The \_\_\_\_\_ directive aligns the current location to a specified boundary by padding with zeros.
- |          |         |
|----------|---------|
| a) ALIGN | b) AREA |
| c) END   | d) DCD  |
- 13) \_\_\_\_\_ vector is location of the first instruction executed by the processor when powered on.
- |              |               |
|--------------|---------------|
| a) Undefined | b) Abort      |
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- 14) If the register R2 contains the hexadecimal number A3A33838, the hexadecimal value of the number stored in register R4 after executing ARM instruction MVN R4, R2 will be \_\_\_\_\_.
- |             |                      |
|-------------|----------------------|
| a) 3A3A8383 | b) 5353C7C7          |
| c) 5C5CC7C7 | d) None of the above |

<b>Seat No.</b>	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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**Section – I**

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

- a) Write an ARM ASM code to find smallest number from a series of 16 bit numbers.
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- a) What is pipeline? Explain the effect of pipeline on program execution with example.
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  - i) The motor is connected to port pins P0.10, P0.11, P0.12, and P0.13.
  - ii) Rotate motor in anti-clockwise direction

**Section – II**

**Q.4 Attempt any four of the following question. 16**

- a) Define the context Switching. Explain with timing diagram the steps involved in  $\mu$ cos-II context switching?
- b) Draw & discuss block diagram of Smart card.
- c) Define priority inheritance also elaborates with example.
- d) Discuss shared data problem and methods to solve it.
- e) Discuss different kernel services in  $\mu$ cos-II

**Q.5 Attempt any two of the following question. 12**

- a) Explain the task state diagram for  $\mu$ cos-II. State various functions related to task.
- b) What is scheduling? Explain Non Preemptive scheduling methods in RTOS.
- c) What is semaphore? Explain how semaphore can be used for Resource synchronization in RTOS.

Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- 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) The \_\_\_\_\_ directive aligns the current location to a specified boundary by padding with zeros.
 

a) ALIGN	b) AREA
c) END	d) DCD
- 2) \_\_\_\_\_ vector is location of the first instruction executed by the processor when powered on.
 

a) Undefined	b) Abort
c) Reset	d) Data abort
- 3) If the register R2 contains the hexadecimal number A3A33838, the hexadecimal value of the number stored in register R4 after executing ARM instruction MVN R4, R2 will be \_\_\_\_\_.
 

a) 3A3A8383	b) 5353C7C7
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a) Scheduler	b) Semaphore
c) Mailbox	d) Mutex
- 5) Pipes in RTOS are entirely \_\_\_\_\_ oriented.
 

a) Byte	b) Bit
c) Bit & Byte	d) none
- 6) Inter Process Communication can be done through \_\_\_\_\_.
 

a) Mailbox	b) Messages Queue
c) Both a and b	d) Trap
- 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 binary semaphore \_\_\_\_\_.
 

a) is essential to binary computers	b) has the values one or zero
c) is used only for synchronization	d) is used only for mutual exclusion





Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

Day & Date: Monday, 25-11-2019  
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**Section – II**

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Seat No.	
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**T.E. (Part - II) (New) (CBCS) Examination Nov/Dec-2019**  
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Day & Date: Monday, 25-11-2019  
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**Section – I**

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

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**Section – II**

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Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INDUSTRIAL ELECTRONICS**

Day & Date: Tuesday, 26-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) Figures to the right 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) In case of class A type commutation with low value of load resistance \_\_\_\_\_.
  - a) L is connected across R
  - b) L-C is connected across R
  - c) L is connected in series with R
  - d) L-C is connected in series with R
- 2) Thyristor is a \_\_\_\_\_.
  - a) DC switch
  - b) bilateral device
  - c) latch proof device
  - d) voltage controlled device
- 3) Inductor is connected in series with the thyristor to \_\_\_\_\_.
  - a) reduce  $dv/dt$  across it
  - b) protect against  $di/dt$
  - c) protect over voltage
  - d) trigger thyristor
- 4) In dual converter due to circulating current \_\_\_\_\_.
  - a) losses are increases
  - b) losses are reduces
  - c) efficiency increases
  - d) improves power factor
- 5) Average value of output voltage for single phase fully controlled bridge converter with inductive load \_\_\_\_\_.
  - a)  $\frac{V_m}{\sqrt{2}}$
  - b)  $\frac{2V_m}{\pi} \cos \alpha$
  - c)  $\frac{V_m}{\pi} \cos \alpha$
  - d)  $\frac{V_m}{2\pi} (1 + \cos \alpha)$
- 6) A triac is equivalent to two SCRs \_\_\_\_\_.
  - a) In parallel
  - b) In series
  - c) In inverse-parallel
  - d) In inverse- series
- 7) Latching current for the GTOs is \_\_\_\_\_ as compared to conventional thyristors.
  - a) more
  - b) Less
  - c) constant
  - d) cannot be said
- 8) Which of the following method will turn SCS on?
  - a) Applying positive pulse to cathode gate
  - b) Applying positive pulse to anode gate
  - c) Applying negative pulse to cathode gate
  - d) None of above

- 9) Induction heating is used for \_\_\_\_\_.
- a) Insulating material                      b) Conducting material  
c) Non conducting material                d) Plastic material
- 10) In \_\_\_\_\_, the heating is uniform throughout workpiece.
- a) Dielectric heating                      b) Induction heating  
c) Resistance heating                      d) Infrared heating
- 11) The output voltage of boost converter is \_\_\_\_\_.
- a) Less than input                          b) Greater than input  
c) Equal to input                            d) None of above
- 12) A SMPS operating at 25KHz to 100KHz range uses main switching power device \_\_\_\_\_.
- a) SCR    b) GTO  
c) Thyristor                                      d) MOSFET
- 13) The combined package of LED & photodiode is known as \_\_\_\_\_.
- a) optocoupler                                b) Optoisolator  
c) sensor                                         d) both a & b
- 14) In UJT when the temperature increases, the intrinsic stand off ratio \_\_\_\_.
- a) Increases                                    b) Decrease  
c) Remains the same                        d) None of the above

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
INDUSTRIAL ELECTRONICS**

Day & Date: Tuesday, 26-11-2019  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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

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

- Describe how to protect power device from overvoltage and overcurrent using RC snubber circuit.
- Prove that thyristor is latching device with help of two transistor analogy.
- Compare circulating and non circulating current mode of Single phase dual converter.
- Sketch the cross sectional view of GTO. Explain its operation.
- A single phase semiconverter is operated from 120V, 60Hz AC supply. The  $R_L$  is  $10\Omega$ . If the average output voltage is 25% of the maximum possible output voltage. Determine:
  - Firing angle
  - Average DC voltage
  - RMS DC voltage

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

- What is meant by forced commutation? Explain working of Class D auxiliary commutation. Sketch associated waveforms.
- With help of structural diagram illustrate switching action, V-I characteristics and different triggering modes of TRIAC.
- Derive an exp for Average load voltage and RMS Voltage for single phase fully controlled bridge converter with highly inductive load. Sketch associated waveforms for  $\alpha = 45^\circ$  Prove that bridge converter with highly inductive load acts as a two quadrant converter

**Section – II**

**Q.4 Attempt any four of the following questions. 16**

- With suitable block diagram explain working of ON line UPS.
- What is necessity of optocoupler? Explain its different configuration.
- With suitable circuit diagram explain working single phase inverter system.
- Explain working of solid state voltage stabilizer using Thyristors.
- With suitable circuit diagram illustrate working of battery charger circuit.

**Q.5 Attempt any two of the following questions. 12**

- Explain equivalent circuit & VI Characteristics of PUT. Explain working of an oscillator employing PUT. Derive an expression for frequency of triggering.
- Draw a neat block diagram of switched mode power supply and explain its working.
- Explain working principle of Dielectric heating. Describe any two application of dielectric heating.

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
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**INDUSTRIAL ELECTRONICS**

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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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c)  $\frac{V_m}{\pi} \cos \alpha$     d)  $\frac{V_m}{2\pi} (1 + \cos \alpha)$
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**Section – I**

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  - 1) Firing angle
  - 2) Average DC voltage
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- b) With help of structural diagram illustrate switching action, V-I characteristics and different triggering modes of TRIAC.
- c) Derive an exp for Average load voltage and RMS Voltage for single phase fully controlled bridge converter with highly inductive load. Sketch associated waveforms for  $\alpha = 45^\circ$  Prove that bridge converter with highly inductive load acts as a two quadrant converter

**Section – II**

**Q.4 Attempt any four of the following questions. 16**

- a) With suitable block diagram explain working of ON line UPS.
- b) What is necessity of optocoupler? Explain its different configuration.
- c) With suitable circuit diagram explain working single phase inverter system.
- d) Explain working of solid state voltage stabilizer using Thyristors.
- e) With suitable circuit diagram illustrate working of battery charger circuit.

**Q.5 Attempt any two of the following questions. 12**

- a) Explain equivalent circuit & VI Characteristics of PUT. Explain working of an oscillator employing PUT. Derive an expression for frequency of triggering.
- b) Draw a neat block diagram of switched mode power supply and explain its working.
- c) Explain working principle of Dielectric heating. Describe any two application of dielectric heating.

Seat  
No.

**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INDUSTRIAL ELECTRONICS**

Day & Date: Tuesday, 26-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) Figures to the right 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) Average value of output voltage for single phase fully controlled bridge converter with inductive load \_\_\_\_\_.
  - a)  $\frac{V_m}{\sqrt{2}}$
  - b)  $\frac{2V_m}{\pi} \cos \alpha$
  - c)  $\frac{V_m}{\pi} \cos \alpha$
  - d)  $\frac{V_m}{2\pi} (1 + \cos \alpha)$
- 2) A triac is equivalent to two SCRs \_\_\_\_\_.
  - a) In parallel
  - b) In series
  - c) In inverse-parallel
  - d) In inverse- series
- 3) Latching current for the GTOs is \_\_\_\_\_ as compared to conventional thyristors.
  - a) more
  - b) Less
  - c) constant
  - d) cannot be said
- 4) Which of the following method will turn SCS on?
  - a) Applying positive pulse to cathode gate
  - b) Applying positive pulse to anode gate
  - c) Applying negative pulse to cathode gate
  - d) None of above
- 5) Induction heating is used for \_\_\_\_\_.
  - a) Insulating material
  - b) Conducting material
  - c) Non conducting material
  - d) Plastic material
- 6) In \_\_\_\_\_, the heating is uniform throughout workpiece.
  - a) Dielectric heating
  - b) Induction heating
  - c) Resistance heating
  - d) Infrared heating
- 7) The output voltage of boost converter is \_\_\_\_\_.
  - a) Less than input
  - b) Greater than input
  - c) Equal to input
  - d) None of above
- 8) A SMPS operating at 25KHz to 100KHz range uses main switching power device \_\_\_\_\_.
  - a) SCR
  - b) GTO
  - c) Thyristor
  - d) MOSFET
- 9) The combined package of LED & photodiode is known as \_\_\_\_\_.
  - a) optocoupler
  - b) Optoisolator
  - c) sensor
  - d) both a & b



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Max. Marks: 56

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**Section – I**

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

- Describe how to protect power device from overvoltage and overcurrent using RC snubber circuit.
- Prove that thyristor is latching device with help of two transistor analogy.
- Compare circulating and non circulating current mode of Single phase dual converter.
- Sketch the cross sectional view of GTO. Explain its operation.
- A single phase semiconverter is operated from 120V, 60Hz AC supply. The  $R_L$  is  $10\Omega$ . If the average output voltage is 25% of the maximum possible output voltage. Determine:
  - Firing angle
  - Average DC voltage
  - RMS DC voltage

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

- What is meant by forced commutation? Explain working of Class D auxiliary commutation. Sketch associated waveforms.
- With help of structural diagram illustrate switching action, V-I characteristics and different triggering modes of TRIAC.
- Derive an exp for Average load voltage and RMS Voltage for single phase fully controlled bridge converter with highly inductive load. Sketch associated waveforms for  $\alpha = 45^\circ$  Prove that bridge converter with highly inductive load acts as a two quadrant converter

**Section – II**

**Q.4 Attempt any four of the following questions. 16**

- With suitable block diagram explain working of ON line UPS.
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Duration: 30 Minutes

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- 4) The combined package of LED & photodiode is known as \_\_\_\_\_.
  - a) optocoupler
  - b) Optoisolator
  - c) sensor
  - d) both a & b
- 5) In UJT when the temperature increases, the intrinsic stand off ratio \_\_\_\_\_.
  - a) Increases
  - b) Decrease
  - c) Remains the same
  - d) None of the above
- 6) In case of class A type commutation with low value of load resistance \_\_\_\_\_.
  - a) L is connected across R
  - b) L-C is connected across R
  - c) L is connected in series with R
  - d) L-C is connected in series with R
- 7) Thyristor is a \_\_\_\_\_.
  - a) DC switch
  - b) bilateral device
  - c) latch proof device
  - d) voltage controlled device
- 8) Inductor is connected in series with the thyristor to \_\_\_\_\_.
  - a) reduce dv/dt across it
  - b) protect against di/dt
  - c) protect over voltage
  - d) trigger thyristor
- 9) In dual converter due to circulating current \_\_\_\_\_.
  - a) losses are increases
  - b) losses are reduces
  - c) efficiency increases
  - d) improves power factor



Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
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**VLSI DESIGN**

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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

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

- 1) Which VHDL data type can only have value of '1' or '0'?
  - a) Signal
  - b) Bit
  - c) Std-logic
  - d) Integer
- 2) In Moore circuits, the output depends on \_\_\_\_\_.
  - a) present state
  - b) present state and past inputs
  - c) inputs
  - d) None
- 3) Process in VHDL becomes active, when \_\_\_\_\_.
  - a) change in clock statement
  - b) there is a change in value of signal insensitivity list
  - c) change in reset signal
  - d) none of above
- 4) In an entity statement buffer is \_\_\_\_\_.
  - a) signal type
  - b) signal Port
  - c) signal mode
  - d) None
- 5) Variable in VHDL is used in \_\_\_\_\_.
  - a) Process
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  - d) All of above
- 6) Which of the following is not VHDL object data?
  - a) Signal
  - b) Variable
  - c) Wire
  - d) Constant
- 7) As per IEEE 1164 standard 'W' represents \_\_\_\_\_.
  - a) Forcing unknown
  - b) High Impedance
  - c) Weak unknown
  - d) Weak '1'
- 8) The CPLD contains several PLD blocks and \_\_\_\_\_.
  - a) AND-OR arrays
  - b) A language compiler
  - c) Field programmable switches
  - d) A global interconnect matrix
- 9) Synthesis means \_\_\_\_\_.
  - a) Checking correctness of the Design
  - b) Conversion of the Design to actual component
  - c) Implement design into target technology
  - d) None of Above

- 10) A single pattern that may be interpreted as a result of all the applied tests in testing is \_\_\_\_\_.
- a) MIC
  - b) PRBSG
  - c) SIC
  - d) Signature
- 11) The element in product term allocator that connect their input to one of their two or three outputs is \_\_\_\_\_.
- a) product term OE
  - b) Multiplexer
  - c) programmable signal steering element
  - d) None of these
- 12) The power dissipation of CMOS IC will \_\_\_\_\_.
- a) Decrease with frequency
  - b) Increase with gate size
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- 13) CMOS logic consists of \_\_\_\_\_.
- a) pull up network
  - b) pull down network
  - c) both a) and b)
  - d) None of above
- 14) Which among the following is an output generated by synthesis process?
- a) Attributes and Library
  - b) RTL VHDL description
  - c) Circuit constraints
  - d) Gate-level net list

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
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Day & Date: Wednesday, 27-11-2019  
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Max. Marks: 56

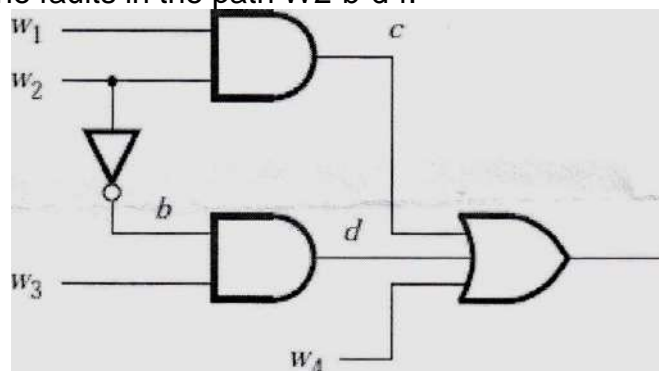
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**Section – I**

- Q.2 Solve any four of the following question. 16**
- Explain Data types of VHDL in detail.
  - Write a VHDL Code for 4x4 bit multiplier.
  - Explain process statement in detail.
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  - Write VHDL code for 8 bit serial in serial out shift register.

**Section – II**

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  - Draw and explain 3 input CMOS NAND gate.
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- Explain the CMOS noise margin in detail.
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- Explain Xilinx Spartan 4000 FPGA architecture.
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
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Duration: 30 Minutes

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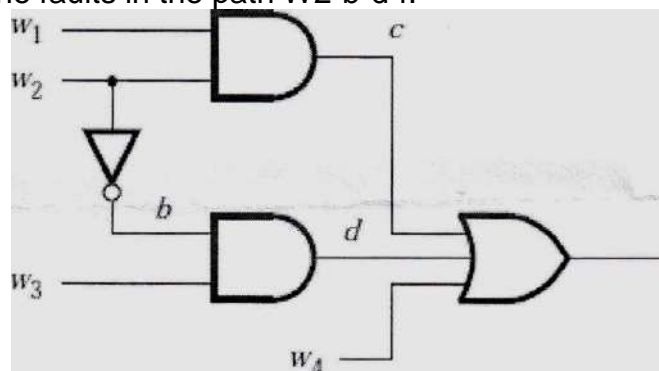
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**Set**

<b>R</b>
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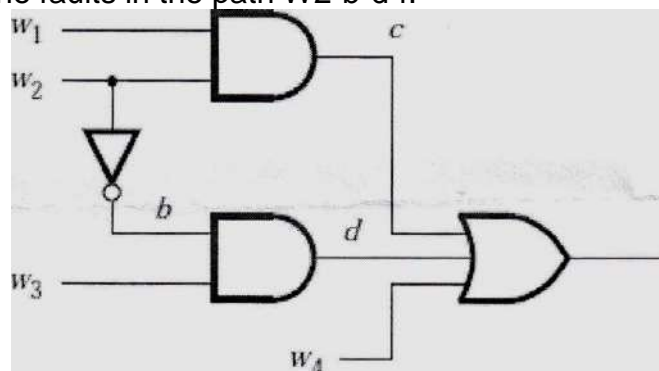
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 c) signal mode  
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  - b) Procedure
  - c) Function
  - d) All of above
- 11) Which of the following is not VHDL object data?
- a) Signal
  - b) Variable
  - c) Wire
  - d) Constant
- 12) As per IEEE 1164 standard 'W' represents \_\_\_\_\_.
- a) Forcing unknown
  - b) High Impedance
  - c) Weak unknown
  - d) Weak '1'
- 13) The CPLD contains several PLD blocks and \_\_\_\_\_.
- a) AND-OR arrays
  - b) A language compiler
  - c) Field programmable switches
  - d) A global interconnect matrix
- 14) Synthesis means \_\_\_\_\_.
- a) Checking correctness of the Design
  - b) Conversion of the Design to actual component
  - c) Implement design into target technology
  - d) None of Above

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**VLSI DESIGN**

Day & Date: Wednesday, 27-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

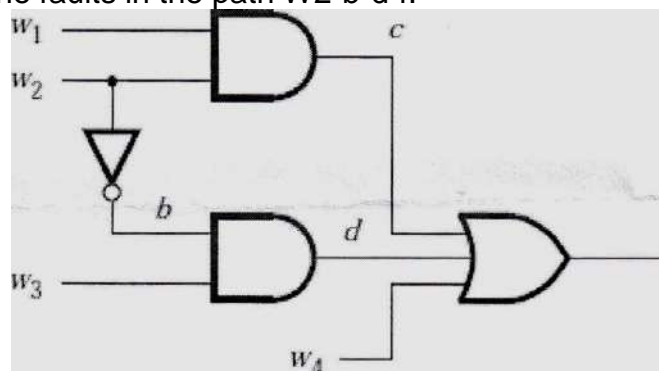
- Instructions:** 1) All questions compulsory.  
 2) Figures to the right indicates full marks.

**Section – I**

- Q.2 Solve any four of the following question. 16**
- Explain Data types of VHDL in detail.
  - Write a VHDL Code for 4x4 bit multiplier.
  - Explain process statement in detail.
  - Write a VHDL code for half adder and full adder.
  - Explain data objects i.e. constant, signal, and variable in detail.
- Q.3 Solve any two of the following question. 12**
- Explain different operators in detail. Write a short note of operator overloading.
  - Write VHDL code for Mealy machine to detect sequence 101.
  - Write VHDL code for 8 bit serial in serial out shift register.

**Section – II**

- Q.4 Solve any four of the following question. 16**
- Explain function block for CPLD.
  - Draw and explain 3 input CMOS NAND gate.
  - Explain path sensitizing. Determine the values of  $W_1$ ,  $W_2$ ,  $W_3$  and  $W_4$  for detecting all the faults in the path  $W_2$ - $b$ - $d$ - $f$ .



- Explain the CMOS noise margin in detail.
  - Explain in brief functional gate level verification.
- Q.5 Solve any two of the following question. 12**
- Explain Xilinx Spartan 4000 FPGA architecture.
  - Draw and explain the schematic arrangement for testing sequential circuits.
  - Explain the different regions of operation of CMOS Inverter along with equations.

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) The transmission, \_\_\_\_\_.
  - a) converts rotary to linear motion
  - b) optimizes the transfer of engine power to the drivetrain
  - c) has four forward speeds and one reverse
  - d) automatically selects the highest gear ratio
- 2) What does a microcomputer use to interface with other systems?
  - a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above
- 3) What advantages does digital signal processing have over analog signal processing?
  - a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
  - d) all of the above
- 4) What does a sensor do?
  - a) it selects transmission gear ratio
  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver
- 5) A thermistor is \_\_\_\_\_.
  - a) a semiconductor temperature sensor
  - b) a device for regulating engine temperature
  - c) a temperature control system for the passenger
  - d) a new type of transistor
- 6) The purpose of a rectifier in an alternator is to \_\_\_\_\_.
  - a) change AC to DC voltage
  - b) Control alternator output current
  - c) change DC to AC voltage
  - d) control alternator output voltage
- 7) 'Star' and 'Delta' are types of \_\_\_\_\_.
  - a) rotor winding
  - b) stator winding
  - c) field winding
  - d) Regulator winding

- 8) The main advantage of using light emitting diodes (LEDs) in vehicle lighting is \_\_\_\_\_.
- a) the variety of colours available      b) that they produce whiter light  
c) their long life                              d) all of the above
- 9) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.
- a) 1.000    b) 1.100  
c) 1.280    d) 1.500
- 10) A window lift motor drives through a worm gear because this: \_\_\_\_\_.
- a) increases speed and torque  
b) reduces speed and torque  
c) increases speed and reduces torque  
d) reduces speed and increases torque

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

- 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 question. 12**
- a) Discuss the advantages of digital over analog.
  - b) Write a note on electronic engine control system
  - c) Write a note on temperature sensor used in automotive.
  - d) Write a note on selection of appropriate sensor for various auto parameters.
- Q.3 Attempt any one of the following question. 08**
- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
  - d) What are the modern trends in automotive diagnostics system?
  - e) Explain transmission control system related to automobile engine.
- Q.5 Attempt any one: 08**
- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
  - b) What are the types of communication buses used in automobile? Describe any one in detail.

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) The purpose of a rectifier in an alternator is to \_\_\_\_\_.
  - a) change AC to DC voltage
  - b) Control alternator output current
  - c) change DC to AC voltage
  - d) control alternator output voltage
- 2) 'Star' and 'Delta' are types of \_\_\_\_\_.
  - a) rotor winding
  - b) stator winding
  - c) field winding
  - d) Regulator winding
- 3) The main advantage of using light emitting diodes (LEDs) in vehicle lighting is \_\_\_\_\_.
  - a) the variety of colours available
  - b) that they produce whiter light
  - c) their long life
  - d) all of the above
- 4) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.
  - a) 1.000
  - b) 1.100
  - c) 1.280
  - d) 1.500
- 5) A window lift motor drives through a worm gear because this: \_\_\_\_\_.
  - a) increases speed and torque
  - b) reduces speed and torque
  - c) increases speed and reduces torque
  - d) reduces speed and increases torque
- 6) The transmission, \_\_\_\_\_.
  - a) converts rotary to linear motion
  - b) optimizes the transfer of engine power to the drivetrain
  - c) has four forward speeds and one reverse
  - d) automatically selects the highest gear ratio
- 7) What does a microcomputer use to interface with other systems?
  - a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above



- 8) What advantages does digital signal processing have over analog signal processing?
- a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
  - d) all of the above
- 9) What does a sensor do?
- a) it selects transmission gear ratio
  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver
- 10) A thermistor is \_\_\_\_\_.
- a) a semiconductor temperature sensor
  - b) a device for regulating engine temperature
  - c) a temperature control system for the passenger
  - d) a new type of transistor

<b>Seat No.</b>	
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**Set Q**

**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

- 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 question. 12**
- a) Discuss the advantages of digital over analog.
  - b) Write a note on electronic engine control system
  - c) Write a note on temperature sensor used in automotive.
  - d) Write a note on selection of appropriate sensor for various auto parameters.
- Q.3 Attempt any one of the following question. 08**
- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
  - d) What are the modern trends in automotive diagnostics system?
  - e) Explain transmission control system related to automobile engine.
- Q.5 Attempt any one: 08**
- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
  - b) What are the types of communication buses used in automobile? Describe any one in detail.

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.
 

a) 1.000	b) 1.100
c) 1.280	d) 1.500
- 2) A window lift motor drives through a worm gear because this: \_\_\_\_\_.
  - a) increases speed and torque
  - b) reduces speed and torque
  - c) increases speed and reduces torque
  - d) reduces speed and increases torque
- 3) The transmission, \_\_\_\_\_.
  - a) converts rotary to linear motion
  - b) optimizes the transfer of engine power to the drivetrain
  - c) has four forward speeds and one reverse
  - d) automatically selects the highest gear ratio
- 4) What does a microcomputer use to interface with other systems?
 

a) parallel interface	b) analog-to-digital converter
c) digital-to-analog converter	d) all of the above
- 5) What advantages does digital signal processing have over analog signal processing?
  - a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
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  - a) it selects transmission gear ratio
  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver

- 7) A thermistor is \_\_\_\_\_.  
a) a semiconductor temperature sensor  
b) a device for regulating engine temperature  
c) a temperature control system for the passenger  
d) a new type of transistor
- 8) The purpose of a rectifier in an alternator is to \_\_\_\_\_.  
a) change AC to DC voltage  
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- 9) 'Star' and 'Delta' are types of \_\_\_\_\_.  
a) rotor winding  
b) stator winding  
c) field winding  
d) Regulator winding
- 10) The main advantage of using light emitting diodes (LEDs) in vehicle lighting is \_\_\_\_\_.  
a) the variety of colours available  
b) that they produce whiter light  
c) their long life  
d) all of the above

<b>Seat No.</b>	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

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**Section – I**

- Q.2 Attempt any three of the following question. 12**
- a) Discuss the advantages of digital over analog.
  - b) Write a note on electronic engine control system
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  - d) Write a note on selection of appropriate sensor for various auto parameters.
- Q.3 Attempt any one of the following question. 08**
- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
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- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
  - b) What are the types of communication buses used in automobile? Describe any one in detail.

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) What advantages does digital signal processing have over analog signal processing?
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a) rotor winding	b) stator winding
c) field winding	d) Regulator winding
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a) the variety of colours available	b) that they produce whiter light
c) their long life	d) all of the above
- 7) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.
 

a) 1.000	b) 1.100
c) 1.280	d) 1.500

- 8) A window lift motor drives through a worm gear because this: \_\_\_\_\_.
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  - c) has four forward speeds and one reverse
  - d) automatically selects the highest gear ratio
- 10) What does a microcomputer use to interface with other systems?
- a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

- 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 question. 12**
- a) Discuss the advantages of digital over analog.
  - b) Write a note on electronic engine control system
  - c) Write a note on temperature sensor used in automotive.
  - d) Write a note on selection of appropriate sensor for various auto parameters.
- Q.3 Attempt any one of the following question. 08**
- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
  - d) What are the modern trends in automotive diagnostics system?
  - e) Explain transmission control system related to automobile engine.
- Q.5 Attempt any one: 08**
- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
  - b) What are the types of communication buses used in automobile? Describe any one in detail.



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

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

Max. Marks: 50

- Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate maximum marks.  
3) Assume suitable data wherever necessary.

**Q.1 Attempt any four.** **20**

- a) What are the different key issues for locomotion in mobile robots?
- b) Explain spray painting application of robot with neat diagram.
- c) With neat sketch explain working of vision-based sensors.
- d) List down the types of end effectors. Discuss mechanical gripper with neat diagram.
- e) List different robot programming methods.

**Q.2 Attempt any three.** **30**

- a) With neat sketch explain wheeled mobile robots.
- b) Describe the steps involved in preventive maintenance.
- c) Describe operations and functions of machine vision in detail.
- d) Classify robots based on control methods. Explain non servo controlled robots.

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicates 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 signal generators, \_\_\_\_\_.  
 a) Energy is created  
 b) Energy is generated  
 c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency  
 d) All the above
- 2) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.  
 a) High frequencies  
 b) Medium frequencies  
 c) DC  
 d) Low frequencies
- 3) Which of the below is not a building block of frequency measurement?  
 a) Gates  
 b) Shift registers  
 c) Counters  
 d) Schmitt trigger
- 4) \_\_\_\_\_ is used to scale down the input gains so as to match the input signal level of the device.  
 a) Amplifier  
 b) Attenuator  
 c) Converter  
 d) Multiplexer
- 5) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.  
 a) measurement  
 b) resolution  
 c) Precision  
 d) accuracy
- 6) Take odd man out - speed, fidelity, sensitivity, lag \_\_\_\_\_.  
 a) Speed  
 b) fidelity  
 c) sensitivity  
 d) lag
- 7) \_\_\_\_\_ is a measure of signal impurity.  
 a) Fidelity  
 b) distortion  
 c) Error  
 d) power
- 8) The instrument used to study relationship of many signals at one glance is \_\_\_\_\_ analyzer.  
 a) logic  
 b) FFT  
 c) Spectrum  
 d) distortion

- 9) The ultrasonic transmitter uses \_\_\_\_\_ effect.
- |                  |                          |
|------------------|--------------------------|
| a) piezoelectric | b) reverse piezoelectric |
| c) load-cell     | d) hall                  |
- 10) Which of below is a part of typical DAS \_\_\_\_\_?
- |               |                        |
|---------------|------------------------|
| a) transducer | b) signal conditioning |
| c) Buffer     | d) all of these        |

<b>Seat No.</b>	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- 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 one.** **08**  
a) With suitable example show working of universal counter.  
b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
a) Comment on standard deviation and its significance in measurements.  
b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
c) How to protect from electrostatic discharge?  
d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
a) Draw and explain FFT analyzer.  
b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
a) Comment on desirable characteristics of data logger.  
b) Differentiate between a sensor and smart sensor.  
c) What is radiometric conversion?  
d) How to plot instantaneous relationship between two signals- X and Y?

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
2) Figures to the right indicates 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) Take odd man out - speed, fidelity, sensitivity, lag \_\_\_\_\_.
  - a) Speed
  - b) fidelity
  - c) sensitivity
  - d) lag
- 2) \_\_\_\_\_ is a measure of signal impurity.
  - a) Fidelity
  - b) distortion
  - c) Error
  - d) power
- 3) The instrument used to study relationship of many signals at one glance is \_\_\_\_\_ analyzer.
  - a) logic
  - b) FFT
  - c) Spectrum
  - d) distortion
- 4) The ultrasonic transmitter uses \_\_\_\_\_ effect.
  - a) piezoelectric
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- 5) Which of below is a part of typical DAS \_\_\_\_\_?
  - a) transducer
  - b) signal conditioning
  - c) Buffer
  - d) all of these
- 6) In signal generators, \_\_\_\_\_.
  - a) Energy is created
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  - c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency
  - d) All the above
- 7) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.
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- 8) Which of the below is not a building block of frequency measurement?
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  - c) Counters
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- 9) \_\_\_\_\_ is used to scale down the input gains so as to match the input signal level of the device.
- |              |                |
|--------------|----------------|
| a) Amplifier | b) Attenuator  |
| c) Converter | d) Multiplexer |
- 10) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.
- |                |               |
|----------------|---------------|
| a) measurement | b) resolution |
| c) Precision   | d) accuracy   |

<b>Seat No.</b>	
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Set 

<b>Q</b>
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any one.** **08**  
 a) With suitable example show working of universal counter.  
 b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
 a) Comment on standard deviation and its significance in measurements.  
 b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
 c) How to protect from electrostatic discharge?  
 d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
 a) Draw and explain FFT analyzer.  
 b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
 a) Comment on desirable characteristics of data logger.  
 b) Differentiate between a sensor and smart sensor.  
 c) What is radiometric conversion?  
 d) How to plot instantaneous relationship between two signals- X and Y?

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicates 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) The ultrasonic transmitter uses \_\_\_\_\_ effect.
  - a) piezoelectric
  - b) reverse piezoelectric
  - c) load-cell
  - d) hall
- 2) Which of below is a part of typical DAS \_\_\_\_\_?
  - a) transducer
  - b) signal conditioning
  - c) Buffer
  - d) all of these
- 3) In signal generators, \_\_\_\_\_.
  - a) Energy is created
  - b) Energy is generated
  - c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency
  - d) All the above
- 4) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.
  - a) High frequencies
  - b) Medium frequencies
  - c) DC
  - d) Low frequencies
- 5) Which of the below is not a building block of frequency measurement?
  - a) Gates
  - b) Shift registers
  - c) Counters
  - d) Schmitt trigger
- 6) \_\_\_\_\_ is used to scale down the input gains so as to match the input signal level of the device.
  - a) Amplifier
  - b) Attenuator
  - c) Converter
  - d) Multiplexer
- 7) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.
  - a) measurement
  - b) resolution
  - c) Precision
  - d) accuracy
- 8) Take odd man out - speed, fidelity, sensitivity, lag \_\_\_\_\_.
  - a) Speed
  - b) fidelity
  - c) sensitivity
  - d) lag



- 9) \_\_\_\_\_ is a measure of signal impurity.
- |             |               |
|-------------|---------------|
| a) Fidelity | b) distortion |
| c) Error    | d) power      |
- 10) The instrument used to study relationship of many signals at one glance is \_\_\_\_\_ analyzer.
- |             |               |
|-------------|---------------|
| a) logic    | b) FFT        |
| c) Spectrum | d) distortion |

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- 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 one.** **08**  
a) With suitable example show working of universal counter.  
b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
a) Comment on standard deviation and its significance in measurements.  
b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
c) How to protect from electrostatic discharge?  
d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
a) Draw and explain FFT analyzer.  
b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
a) Comment on desirable characteristics of data logger.  
b) Differentiate between a sensor and smart sensor.  
c) What is radiometric conversion?  
d) How to plot instantaneous relationship between two signals- X and Y?



- 9) In signal generators, \_\_\_\_\_.
- a) Energy is created
  - b) Energy is generated
  - c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency
  - d) All the above
- 10) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.
- a) High frequencies
  - b) Medium frequencies
  - c) DC
  - d) Low frequencies

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- 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 one.** **08**  
a) With suitable example show working of universal counter.  
b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
a) Comment on standard deviation and its significance in measurements.  
b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
c) How to protect from electrostatic discharge?  
d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
a) Draw and explain FFT analyzer.  
b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
a) Comment on desirable characteristics of data logger.  
b) Differentiate between a sensor and smart sensor.  
c) What is radiometric conversion?  
d) How to plot instantaneous relationship between two signals- X and Y?

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10**

- 1) AGUI \_\_\_\_\_.
  - a) uses buttons, menus, and icons
  - b) should be easy for a user to manipulate
  - c) both (a) and (b)
  - d) stands for Graphic Use Interaction
- 2) Which does the solution explorer not display?
  - a) Form Properties
  - b) Reference Folder
  - c) Form File
  - d) Assemble File
- 3) The member "clear" of the Array class that sets a range of array elements to zero, false or null reference is a \_\_\_\_\_ method.
  - a) Shared
  - b) Method
  - c) Class
  - d) Object
- 4) An object is composed of \_\_\_\_\_.
  - a) properties
  - b) Methods
  - c) Events
  - d) All of the above
- 5) The CancelButton property belongs to which object?
  - a) Form
  - b) Button
  - c) Label
  - d) TextBox
- 6) Which is not a property of the Common control class?
  - a) Font
  - b) Show
  - c) ForeColor
  - d) BackColor
- 7) VB.Net is \_\_\_\_\_.
  - a) Platform Independent
  - b) Compiler Language
  - c) Forward compatibale
  - d) Backward compatible
- 8) Which of the following property of Array class in VB.NET checks whether the Array has a fixed size?
  - a) IsFixedSize
  - b) IsStatic
  - c) Length
  - d) None of the above.

- 9) Which of the following access modifier specifies that a function or Get accessor is an iterator?
- |        |             |
|--------|-------------|
| a) In  | b) Iterator |
| c) Key | d) Module   |
- 10) \_\_\_\_\_ allows custom items of information about a program element to be stored with an assembly's metadata.
- |               |               |
|---------------|---------------|
| a) Properties | b) Attributes |
| c) Methods    | d) Classes    |

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
2) Figures to the right indicate full marks.

**Q.2** Explain multiple catch block with example? **10**

**Q.3** Explain list box and combo box with example. **10**

**OR**

Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

**Q.4 Attempt any four of the following questions.** **20**

- a) Explain while and do while loops in VB.net.
- b) Explain type casting in VB.NET.
- c) Explain User Defined function with example.
- d) Explain MSIL?
- e) Explain radio button control events.



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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
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**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 is not a property of the Common control class?
  - a) Font
  - b) Show
  - c) ForeColor
  - d) BackColor
- 2) VB.Net is \_\_\_\_\_.
  - a) Platform Independent
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- 3) Which of the following property of Array class in VB.NET checks whether the Array has a fixed size?
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  - c) Length
  - d) None of the above.
- 4) Which of the following access modifier specifies that a function or Get accessor is an iterator?
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  - a) Properties
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  - c) Methods
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- 9) An object is composed of \_\_\_\_\_.
- |               |                     |
|---------------|---------------------|
| a) properties | b) Methods          |
| c) Events     | d) All of the above |
- 10) The CancelButton property belongs to which object?
- |          |            |
|----------|------------|
| a) Form  | b) Button  |
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
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**Q.2** Explain multiple catch block with example? **10**

**Q.3** Explain list box and combo box with example. **10**

**OR**

Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

**Q.4 Attempt any four of the following questions.** **20**

- a) Explain while and do while loops in VB.net.
- b) Explain type casting in VB.NET.
- c) Explain User Defined function with example.
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Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
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**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 access modifier specifies that a function or Get accessor is an iterator?
 

a) In	b) Iterator
c) Key	d) Module
  
- 2) \_\_\_\_\_ allows custom items of information about a program element to be stored with an assembly's metadata.
 

a) Properties	b) Attributes
c) Methods	d) Classes
  
- 3) AGUI \_\_\_\_\_.
 

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- 4) Which does the solution explorer not display?
 

a) Form Properties	b) Reference Folder
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- 5) The member "clear" of the Array class that sets a range of array elements to zero, false or null reference is a \_\_\_\_\_ method.
 

a) Shared	b) Method
c) Class	d) Object
  
- 6) An object is composed of \_\_\_\_\_.
 

a) properties	b) Methods
c) Events	d) All of the above
  
- 7) The CancelButton property belongs to which object?
 

a) Form	b) Button
c) Label	d) TextBox
  
- 8) Which is not a property of the Common control class?
 

a) Font	b) Show
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- 9) VB.Net is \_\_\_\_\_.
 

a) Platform Independent	b) Compiler Language
c) Forward compatibale	d) Backward compatible

- 10) Which of the following property of Array class in VB.NET checks whether the Array has a fixed size?
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<b>Seat No.</b>	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
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**Q.2** Explain multiple catch block with example? **10**

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Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
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**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10**

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<b>Seat No.</b>	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
2) Figures to the right indicate full marks.

- Q.2** Explain multiple catch block with example? **10**
- Q.3** Explain list box and combo box with example. **10**

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Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

- Q.4 Attempt any four of the following questions.** **20**
- a) Explain while and do while loops in VB.net.
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Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
2) Figures to the right indicate full marks.  
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 not the state of a process?
  - a) New
  - b) Old
  - c) Waiting
  - d) Running
- 2) The time required to create a new thread in an existing process is \_\_\_\_\_.
  - a) greater than the time required to create a new process
  - b) less than the time required to create a new process
  - c) equal to the time required to create a new process
  - d) none of the mentioned
- 3) Scheduling is done so as to \_\_\_\_\_.
  - a) increase CPU utilization
  - b) decrease CPU utilization
  - c) keep the CPU more idle
  - d) None of the mentioned
- 4) A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which access takes place is called \_\_\_\_\_.
  - a) data consistency
  - b) race condition
  - c) Aging
  - d) Starvation
- 5) A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_ to ensure that a circular wait condition can never exist.
  - a) resource allocation state
  - b) system storage state
  - c) operating system
  - d) resources
- 6) All unsafe states are \_\_\_\_\_.
  - a) Deadlocks
  - b) not deadlocks
  - c) Fatal
  - d) none of the mentioned
- 7) An Inter process communication (IPC) facility provides atleast two operations \_\_\_\_\_.
  - a) write & delete message
  - b) delete & receive message
  - c) send & delete message
  - d) receive & send message
- 8) Which one of the following is the address generated by CPU?
  - a) physical address
  - b) absolute address
  - c) logical address
  - d) none of the mentioned

- 9) The address of a page table in memory is pointed by \_\_\_\_\_.
- a) stack pointer
  - b) page table base register
  - c) page register
  - d) program counter
- 10) \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
- a) Paging
  - b) Demand paging
  - c) Segmentation
  - d) Swapping
- 11) \_\_\_\_\_ is a unique tag, usually a number, identifies the file within the file system.
- a) File identifier
  - b) File name
  - c) File type
  - d) None of the mentioned
- 12) The data-in register of I/O port is \_\_\_\_\_.
- a) Read by host to get input
  - b) Read by controller to get input
  - c) Written by host to send output
  - d) Written by host to start a command
- 13) The operating system keeps a small table containing information about all open files called \_\_\_\_\_.
- a) system table
  - b) open-file table
  - c) file table
  - d) directory table
- 14) If a higher priority process arrives and wants service, the memory manager can swap out the lower priority process to execute the higher priority process. When the higher priority process finishes, the lower priority process is swapped back in and continues execution. This variant of swapping is sometimes called \_\_\_\_\_.
- a) priority swapping
  - b) pull out, push in
  - c) roll out, roll in
  - d) none of the mentioned

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
OPERATING SYSTEMS**

Day & Date: Friday,22-11-2019  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**

- What is operating system? Explain the different services provided by operating system.
- Explain the multiprogramming operating system.
- What is a process? Describe the different states of a process state diagram.
- Write a short note on critical section problem.
- Describe the First Come First Serve scheduling algorithm with an example.

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

- What is deadlock? List the conditions that lead to deadlock. How deadlock can be prevented?
- What is a scheduler? Describe long term scheduler, short term scheduler and medium term scheduler.
- Consider four processes P1, P2, P3 and P4 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	8	0
P2	4	1
P3	9	2
P4	5	3

- How will these processes be scheduled according to FCFS and Round Robin scheduling algorithm with a quantum of 3 ms?
- Compute the average waiting time and average turnaround time.

**Section – II**

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

- Explain the different file attributes.
- What is fragmentation? Explain different types of fragmentation with neat diagram.
- Draw and explain kernel I/O subsystem.
- Explain demand paging in detail.
- For the page reference string.  
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1  
Calculate the page faults applying the FIFO page replacement algorithm for a memory with three frames

**Q.5 Attempt any two.**

- a)** Why page replacement is needed? Explain LRU and Optimal page replacement algorithms with the help of suitable examples.
- b)** Define paging. Explain paging hardware implementation.
- c)** Explain how swapping mechanism is useful for the multiprogramming operating system.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- 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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  - a) physical address
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- 2) The address of a page table in memory is pointed by \_\_\_\_\_.
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  - a) File identifier
  - b) File name
  - c) File type
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- 5) The data-in register of I/O port is \_\_\_\_\_.
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  - c) file table
  - d) directory table
- 7) If a higher priority process arrives and wants service, the memory manager can swap out the lower priority process to execute the higher priority process. When the higher priority process finishes, the lower priority process is swapped back in and continues execution. This variant of swapping is sometimes called \_\_\_\_\_.
  - a) priority swapping
  - b) pull out, push in
  - c) roll out, roll in
  - d) none of the mentioned



Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**

- What is operating system? Explain the different services provided by operating system.
- Explain the multiprogramming operating system.
- What is a process? Describe the different states of a process state diagram.
- Write a short note on critical section problem.
- Describe the First Come First Serve scheduling algorithm with an example.

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

- What is deadlock? List the conditions that lead to deadlock. How deadlock can be prevented?
- What is a scheduler? Describe long term scheduler, short term scheduler and medium term scheduler.
- Consider four processes P1, P2, P3 and P4 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	8	0
P2	4	1
P3	9	2
P4	5	3

- How will these processes be scheduled according to FCFS and Round Robin scheduling algorithm with a quantum of 3 ms?
- Compute the average waiting time and average turnaround time.

**Section – II**

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

- Explain the different file attributes.
- What is fragmentation? Explain different types of fragmentation with neat diagram.
- Draw and explain kernel I/O subsystem.
- Explain demand paging in detail.
- For the page reference string.  
 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1  
 Calculate the page faults applying the FIFO page replacement algorithm for a memory with three frames



**Q.5 Attempt any two.**

- a) Why page replacement is needed? Explain LRU and Optimal page replacement algorithms with the help of suitable examples.
- b) Define paging. Explain paging hardware implementation.
- c) Explain how swapping mechanism is useful for the multiprogramming operating system.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- 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 and rewrite the sentence.** **14**

- 1) A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_ to ensure that a circular wait condition can never exist.
  - a) resource allocation state
  - b) system storage state
  - c) operating system
  - d) resources
- 2) All unsafe states are \_\_\_\_\_.
  - a) Deadlocks
  - b) not deadlocks
  - c) Fatal
  - d) none of the mentioned
- 3) An Inter process communication (IPC) facility provides atleast two operations \_\_\_\_\_.
  - a) write & delete message
  - b) delete & receive message
  - c) send & delete message
  - d) receive & send message
- 4) Which one of the following is the address generated by CPU?
  - a) physical address
  - b) absolute address
  - c) logical address
  - d) none of the mentioned
- 5) The address of a page table in memory is pointed by \_\_\_\_\_.
  - a) stack pointer
  - b) page table base register
  - c) page register
  - d) program counter
- 6) \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
  - a) Paging
  - b) Demand paging
  - c) Segmentation
  - d) Swapping
- 7) \_\_\_\_\_ is a unique tag, usually a number, identifies the file within the file system.
  - a) File identifier
  - b) File name
  - c) File type
  - d) None of the mentioned
- 8) The data-in register of I/O port is \_\_\_\_\_.
  - a) Read by host to get input
  - b) Read by controller to get input
  - c) Written by host to send output
  - d) Written by host to start a command



Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
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Max. Marks: 56

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**Section – I**

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- a) What is operating system? Explain the different services provided by operating system.
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- c) What is a process? Describe the different states of a process state diagram.
- d) Write a short note on critical section problem.
- e) Describe the First Come First Serve scheduling algorithm with an example.

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

- a) What is deadlock? List the conditions that lead to deadlock. How deadlock can be prevented?
- b) What is a scheduler? Describe long term scheduler, short term scheduler and medium term scheduler.
- c) Consider four processes P1, P2, P3 and P4 with their arrival times and with their required CPU burst in milliseconds.

Process	CPU burst time (ms)	Arrival time
P1	8	0
P2	4	1
P3	9	2
P4	5	3

- i) How will these processes be scheduled according to FCFS and Round Robin scheduling algorithm with a quantum of 3 ms?
- ii) Compute the average waiting time and average turnaround time.

**Section – II**

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

- a) Explain the different file attributes.
- b) What is fragmentation? Explain different types of fragmentation with neat diagram.
- c) Draw and explain kernel I/O subsystem.
- d) Explain demand paging in detail.
- e) For the page reference string.  
 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1  
 Calculate the page faults applying the FIFO page replacement algorithm for a memory with three frames

**Q.5 Attempt any two.**

- a)** Why page replacement is needed? Explain LRU and Optimal page replacement algorithms with the help of suitable examples.
- b)** Define paging. Explain paging hardware implementation.
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Seat No.	
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**Electronics Engineering**  
**OPERATING SYSTEMS**

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Max. Marks: 70

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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 the concept in which a process is copied into main memory from the secondary memory according to the requirement.
  - a) Paging
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  - d) Swapping
- 2) \_\_\_\_\_ is a unique tag, usually a number, identifies the file within the file system.
  - a) File identifier
  - b) File name
  - c) File type
  - d) None of the mentioned
- 3) The data-in register of I/O port is \_\_\_\_\_.
  - a) Read by host to get input
  - b) Read by controller to get input
  - c) Written by host to send output
  - d) Written by host to start a command
- 4) The operating system keeps a small table containing information about all open files called \_\_\_\_\_.
  - a) system table
  - b) open-file table
  - c) file table
  - d) directory table
- 5) If a higher priority process arrives and wants service, the memory manager can swap out the lower priority process to execute the higher priority process. When the higher priority process finishes, the lower priority process is swapped back in and continues execution. This variant of swapping is sometimes called \_\_\_\_\_.
  - a) priority swapping
  - b) pull out, push in
  - c) roll out, roll in
  - d) none of the mentioned
- 6) Which of the following is not the state of a process?
  - a) New
  - b) Old
  - c) Waiting
  - d) Running

- 7) The time required to create a new thread in an existing process is \_\_\_\_\_.  
a) greater than the time required to create a new process  
b) less than the time required to create a new process  
c) equal to the time required to create a new process  
d) none of the mentioned
- 8) Scheduling is done so as to \_\_\_\_\_.  
a) increase CPU utilization                      b) decrease CPU utilization  
c) keep the CPU more idle                      d) None of the mentioned
- 9) A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which access takes place is called \_\_\_\_\_.  
a) data consistency                                      b) race condition  
c) Aging    d) Starvation
- 10) A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_ to ensure that a circular wait condition can never exist.  
a) resource allocation state                      b) system storage state  
c) operating system                                      d) resources
- 11) All unsafe states are \_\_\_\_\_.  
a) Deadlocks    b) not deadlocks  
c) Fatal    d) none of the mentioned
- 12) An Inter process communication (IPC) facility provides atleast two operations \_\_\_\_\_.  
a) write & delete message                      b) delete & receive message  
c) send & delete message                      d) receive & send message
- 13) Which one of the following is the address generated by CPU?  
a) physical address                                      b) absolute address  
c) logical address                                      d) none of the mentioned
- 14) The address of a page table in memory is pointed by \_\_\_\_\_.  
a) stack pointer    b) page table base register  
c) page register    d) program counter

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
OPERATING SYSTEMS**

Day & Date: Friday,22-11-2019  
Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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

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

- What is operating system? Explain the different services provided by operating system.
- Explain the multiprogramming operating system.
- What is a process? Describe the different states of a process state diagram.
- Write a short note on critical section problem.
- Describe the First Come First Serve scheduling algorithm with an example.

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

- What is deadlock? List the conditions that lead to deadlock. How deadlock can be prevented?
- What is a scheduler? Describe long term scheduler, short term scheduler and medium term scheduler.
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P4	5	3

- How will these processes be scheduled according to FCFS and Round Robin scheduling algorithm with a quantum of 3 ms?
- Compute the average waiting time and average turnaround time.

**Section – II**

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

- Explain the different file attributes.
- What is fragmentation? Explain different types of fragmentation with neat diagram.
- Draw and explain kernel I/O subsystem.
- Explain demand paging in detail.
- For the page reference string.  
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1  
Calculate the page faults applying the FIFO page replacement algorithm for a memory with three frames



**Q.5 Attempt any two.**

- a)** Why page replacement is needed? Explain LRU and Optimal page replacement algorithms with the help of suitable examples.
- b)** Define paging. Explain paging hardware implementation.
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Seat  
No.

**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

**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 alternative form the option and rewrite the sentence. 14**

- 1) One of the disadvantages of PCM is \_\_\_\_\_.
  - a) It requires large bandwidth
  - b) Very high noise
  - c) Cannot be decoded easily
  - d) All of the above
- 2) The error probability of a PCM is \_\_\_\_\_.
  - a) Calculated using noise and inter symbol interference
  - b) Gaussian noise + error component due to inter symbol interference
  - c) Calculated using power spectral density
  - d) All of the above
- 3) The factors that cause quantizing error in delta modulation are \_\_\_\_\_.
  - a) Slope overload distortion
  - b) Granular noise
  - c) White noise
  - d) Both a and b are correct
- 4) The number of voice channels that can be accommodated for transmission in T1 carrier system is \_\_\_\_\_.
  - a) 24
  - b) 32
  - c) 56
  - d) 64
- 5) The mutual information \_\_\_\_\_.
  - a) Is symmetric
  - b) Always non negative
  - c) Both a and b are correct
  - d) None of the above
- 6) The memory less source refers to \_\_\_\_\_.
  - a) No previous information
  - b) No message storage
  - c) Emitted message is independent of previous message
  - d) None of the above
- 7) Impulse noise is caused due to \_\_\_\_\_.
  - a) Switching transients
  - b) Lightning strikes
  - c) Power line load switching
  - d) All of the above
- 8) For decoding in convolution coding, in a code tree, \_\_\_\_\_.
  - a) Diverge upward when a bit is 0 and diverge downward when the bit is 1
  - b) Diverge downward when a bit is 0 and diverge upward when the bit is 1
  - c) Diverge left when a bit is 0 and diverge right when the bit is 1
  - d) Diverge right when a bit is 0 and diverge left when the bit is 1

- 9) Parity bit coding may not be used for \_\_\_\_\_.  
a) Error in more than single bit      b) Which bit is in error  
c) Both a & b      d) None of the above
- 10) For hamming distance  $d_{\min}$  and number of errors  $D$ , the condition for receiving invalid codeword is \_\_\_\_\_.  
a)  $D \leq d_{\min} + 1$       b)  $D \leq d_{\min} - 1$   
c)  $D \leq 1 - d_{\min}$       d)  $D \leq d_{\min}$
- 11) The number of bits of data transmitted per second is called \_\_\_\_\_.  
a) Data signaling rate      b) Modulation rate  
c) Coding      d) None of the above
- 12) 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
- 13) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.  
a) Higher      b) Lower  
c) Same      d) Not predictable
- 14) Minimum shift keying is similar to \_\_\_\_\_.  
a) Continuous phase frequency shift keying  
b) Binary phase shift keying  
c) Binary frequency shift keying  
d) QPSK

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

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

- Q.2 Attempt any four of the following questions. 16**
- a) What is information theory? How and why it is related to probability theory?
  - b) Explain a PWM modulator using IC 555.
  - c) Explain flat top and natural sampling. Which is better? Why?
  - d) How Delta modulation is different from PCM?
  - e) Verify the expression  $I(X;Y)=I(Y;X)$
- Q.3 Attempt any two of the following questions. 12**
- a) Compare PCM, DPCM, DM and ADM.
  - b) With suitable block diagram explain sigma delta modulator and demodulator.
  - c) A zero memory source emits messages  $x_1, x_2$  with probabilities 0.8, 0.2 resp. Find the optimum binary code for this source as well as for its 2<sup>nd</sup> and 3<sup>rd</sup> Order extension (i.e.  $N=2$  &  $N=3$ ). Determine code efficiency in each case.

**Section –II**

- Q.4 Attempt any four of the following questions. 16**
- a) Explain generation of ASK from baseband signal.
  - b) Compare QPSK with OQPSK.
  - c) Explain Matched Filter BPSK Detector.
  - d) Explain frame synchronization.
  - e) For message  $M = [0\ 1\ 0\ 1]$  and  $g(x) = 1+x+x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Q.5 Attempt any two of the following questions. 12**
- a) Discuss with suitable example - various synchronizations required in digital communication.
  - b) The generation matrix for (6,3) block code is given below find all code vectors of this code.
- $$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$
- What is the minimum distance between the code vectors?  
 How many errors can be detected? How many errors can be correct?
- c) With suitable signal space representation explain QAM.

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
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**DIGITAL COMMUNICATION**

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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative form the option and rewrite the sentence. 14**

- 1) For decoding in convolution coding, in a code tree, \_\_\_\_\_.
  - a) Diverge upward when a bit is 0 and diverge downward when the bit is 1
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  - d) Diverge right when a bit is 0 and diverge left when the bit is 1
- 2) Parity bit coding may not be used for \_\_\_\_\_.
  - a) Error in more than single bit
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- 3) For hamming distance  $d_{min}$  and number of errors  $D$ , the condition for receiving invalid codeword is \_\_\_\_\_.
  - a)  $D \leq d_{min} + 1$
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  - c)  $D \leq 1 - d_{min}$
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- 4) The number of bits of data transmitted per second is called \_\_\_\_\_.
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Seat No.	
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**Section I**

- Q.2 Attempt any four of the following questions. 16**
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Duration: 30 Minutes

Marks: 14

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  - Explain a PWM modulator using IC 555.
  - Explain flat top and natural sampling. Which is better? Why?
  - How Delta modulation is different from PCM?
  - Verify the expression  $I(X;Y)=I(Y;X)$
- Q.3 Attempt any two of the following questions. 12**
- Compare PCM, DPCM, DM and ADM.
  - With suitable block diagram explain sigma delta modulator and demodulator.
  - A zero memory source emits messages  $x_1, x_2$  with probabilities 0.8, 0.2 resp. Find the optimum binary code for this source as well as for its 2<sup>nd</sup> and 3<sup>rd</sup> Order extension (i.e.  $N=2$  &  $N=3$ ). Determine code efficiency in each case.

**Section –II**

- Q.4 Attempt any four of the following questions. 16**
- Explain generation of ASK from baseband signal.
  - Compare QPSK with OQPSK.
  - Explain Matched Filter BPSK Detector.
  - Explain frame synchronization.
  - For message  $M = [0\ 1\ 0\ 1]$  and  $g(x) = 1+x+x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Q.5 Attempt any two of the following questions. 12**
- Discuss with suitable example - various synchronizations required in digital communication.
  - The generation matrix for (6,3) block code is given below find all code vectors of this code.
- $$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$
- What is the minimum distance between the code vectors?  
 How many errors can be detected? How many errors can be correct?
- With suitable signal space representation explain QAM.

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative form the option and rewrite the sentence. 14**

- 1) For hamming distance  $d_{\min}$  and number of errors  $D$ , the condition for receiving invalid codeword is \_\_\_\_\_.
  - a)  $D \leq d_{\min} + 1$
  - b)  $D \leq d_{\min} - 1$
  - c)  $D \leq 1 - d_{\min}$
  - d)  $D \leq d_{\min}$
- 2) The number of bits of data transmitted per second is called \_\_\_\_\_.
  - a) Data signaling rate
  - b) Modulation rate
  - c) Coding
  - d) None of the above
- 3) 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
- 4) The probability of error of DPSK is \_\_\_\_\_ than that of BPSK.
  - a) Higher
  - b) Lower
  - c) Same
  - d) Not predictable
- 5) Minimum shift keying is similar to \_\_\_\_\_.
  - a) Continuous phase frequency shift keying
  - b) Binary phase shift keying
  - c) Binary frequency shift keying
  - d) QPSK
- 6) One of the disadvantages of PCM is \_\_\_\_\_.
  - a) It requires large bandwidth
  - b) Very high noise
  - c) Cannot be decoded easily
  - d) All of the above
- 7) The error probability of a PCM is \_\_\_\_\_.
  - a) Calculated using noise and inter symbol interference
  - b) Gaussian noise + error component due to inter symbol interference
  - c) Calculated using power spectral density
  - d) All of the above
- 8) The factors that cause quantizing error in delta modulation are \_\_\_\_\_.
  - a) Slope overload distortion
  - b) Granular noise
  - c) White noise
  - d) Both a and b are correct



Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL COMMUNICATION**

Day & Date: Saturday, 23-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**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**
- What is information theory? How and why it is related to probability theory?
  - Explain a PWM modulator using IC 555.
  - Explain flat top and natural sampling. Which is better? Why?
  - How Delta modulation is different from PCM?
  - Verify the expression  $I(X;Y)=I(Y;X)$
- Q.3 Attempt any two of the following questions. 12**
- Compare PCM, DPCM, DM and ADM.
  - With suitable block diagram explain sigma delta modulator and demodulator.
  - A zero memory source emits messages  $x_1, x_2$  with probabilities 0.8, 0.2 resp. Find the optimum binary code for this source as well as for its 2<sup>nd</sup> and 3<sup>rd</sup> Order extension (i.e.  $N=2$  &  $N=3$ ). Determine code efficiency in each case.

**Section –II**

- Q.4 Attempt any four of the following questions. 16**
- Explain generation of ASK from baseband signal.
  - Compare QPSK with OQPSK.
  - Explain Matched Filter BPSK Detector.
  - Explain frame synchronization.
  - For message  $M = [0\ 1\ 0\ 1]$  and  $g(x) = 1+x+x^3$  show a systematic (7,4) cyclic code encoder circuit and stepwise encoding of M.
- Q.5 Attempt any two of the following questions. 12**
- Discuss with suitable example - various synchronizations required in digital communication.
  - The generation matrix for (6,3) block code is given below find all code vectors of this code.
- $$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$
- What is the minimum distance between the code vectors?  
 How many errors can be detected? How many errors can be correct?
- With suitable signal space representation explain QAM.

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day &amp; 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 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) 8051 has \_\_\_\_\_ parallel I/O ports.
 

a) 2	b) 3
c) 4	d) 5
- 2) How many timers are available in 8051?
 

a) 2	b) 3
c) 5	d) 4
- 3) Which of the following instruction will move the number 10H to Accumulator?
 

a) MOV A, #10H	b) MOV A, 10H
c) MOV A, P10	d) MOV A, @10H4
- 4) MOVC instruction uses following operands.
 

a) PC only	b) A and A + PC
c) A and Ri + PC	d) A and Ri + DPTR
- 5) In 8051 which interrupt has highest priority?
 

a) IE1	b) TF0
c) IE0	d) TF1
- 6) To transfer a data serially by using TXD pin of 8051, the data must be placed in \_\_\_\_\_.
 

a) SCON	b) SMOD
c) SBUF	d) PCON
- 7) What is the address range of SFR Register bank in 8051?
 

a) 00H-77H	b) 40H-80H
c) 80H-7FH	d) 80H-FFH
- 8) The PIC 16F877 has \_\_\_\_\_ on chip flash program memory.
 

a) 4K x 8 bytes	b) 4K x 14 words
c) 8K x 8 bytes	d) 8K x 14 words
- 9) The PIC 16F877 has \_\_\_\_\_ I/O ports.
 

a) 4	b) 5
c) 6	d) 3
- 10) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
 

a) 8, 13	b) 13, 8
c) 8, 12	d) 12, 8

- 11) What is the address of the last location of on-chip flash program memory for PIC 16F877?
- |           |           |
|-----------|-----------|
| a) 0FFF h | b) 1FFF h |
| c) FFFF h | d) 7FFF h |
- 12) The instruction “movlw D’200” loads the W register with \_\_\_\_\_.
- |         |             |
|---------|-------------|
| a) 200h | b) C8h      |
| c) 8C h | d) 11011000 |
- 13) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
- |            |            |
|------------|------------|
| a) Timer 0 | b) Timer 2 |
| c) Timer 1 | d) Timer 3 |
- 14) The PIC 16F877 has \_\_\_\_\_ bytes on chip EEPROM data memory.
- |        |        |
|--------|--------|
| a) 192 | b) 128 |
| c) 368 | d) 256 |

<b>Seat No.</b>	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.  
 3) Assume suitable data whenever necessary.

**Section – I**

- Q.2 Attempt any four of the following questions. 16**
- a) Differentiate between microprocessor and microcontroller.
  - b) Write a program to add five BCD numbers.
  - c) Discuss 8051 addressing modes with example.
  - d) Draw and explain port structure in 8051.
  - e) Explain modes of serial communication on 8051
- Q.3 Attempt any two of the following questions. 12**
- a) Interface DAC 0808 to 8051. Write an ALP or C program to generate square wave if switch is pressed else generate triangular wave.
  - b) Explain interrupts in 8051 with their vector addresses, causes, flags affected, and priorities.
  - c) Interface LCD to 8051. Write an ALP or C program to display "OK" on second line.

**Section – II**

- Q.4 Attempt any four of the following questions. 16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 2 in PIC 16F877
- Q.5 Attempt any two of the following question. 12**
- a) Explain the following instructions with their syntax and suitable example.
    - 1) BTFSS
    - 2) DECFSSZ
    - 3) RETLW
    - 4) IORWF
  - b) How do you use the PORT D as PSP? Explain the different control signals and flags used in PSP communication.
  - c) Interface DAC to PIC 16F877 and write a program to generate a square wave and triangular wave.



Seat  
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data 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 PIC 16F877 has \_\_\_\_\_ on chip flash program memory.
  - a) 4K x 8 bytes
  - b) 4K x 14 words
  - c) 8K x 8 bytes
  - d) 8K x 14 words
- 2) The PIC 16F877 has \_\_\_\_\_ I/O ports.
  - a) 4
  - b) 5
  - c) 6
  - d) 3
- 3) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
  - a) 8, 13
  - b) 13, 8
  - c) 8, 12
  - d) 12, 8
- 4) What is the address of the last location of on-chip flash program memory for PIC 16F877?
  - a) 0FFF h
  - b) 1FFF h
  - c) FFFF h
  - d) 7FFF h
- 5) The instruction "movlw D'200" loads the W register with \_\_\_\_\_.
  - a) 200h
  - b) C8h
  - c) 8C h
  - d) 11011000
- 6) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
  - a) Timer 0
  - b) Timer 2
  - c) Timer 1
  - d) Timer 3
- 7) The PIC 16F877 has \_\_\_\_\_ bytes on chip EEPROM data memory.
  - a) 192
  - b) 128
  - c) 368
  - d) 256
- 8) 8051 has \_\_\_\_\_ parallel I/O ports.
  - a) 2
  - b) 3
  - c) 4
  - d) 5
- 9) How many timers are available in 8051?
  - a) 2
  - b) 3
  - c) 5
  - d) 4
- 10) Which of the following instruction will move the number 10H to Accumulator?
  - a) MOV A, #10H
  - b) MOV A, 10H
  - c) MOV A, P10
  - d) MOV A, @10H4

- 11) MOVC instruction uses following operands.
- |                  |                    |
|------------------|--------------------|
| a) PC only       | b) A and A + PC    |
| c) A and Ri + PC | d) A and Ri + DPTR |
- 12) In 8051 which interrupt has highest priority?
- |        |        |
|--------|--------|
| a) IE1 | b) TF0 |
| c) IE0 | d) TF1 |
- 13) To transfer a data serially by using TXD pin of 8051, the data must be placed in \_\_\_\_\_.
- |         |         |
|---------|---------|
| a) SCON | b) SMOD |
| c) SBUF | d) PCON |
- 14) What is the address range of SFR Register bank in 8051?
- |            |            |
|------------|------------|
| a) 00H-77H | b) 40H-80H |
| c) 80H-7FH | d) 80H-FFH |

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.  
 3) Assume suitable data whenever necessary.

**Section – I**

- Q.2 Attempt any four of the following questions. 16**
- a) Differentiate between microprocessor and microcontroller.
  - b) Write a program to add five BCD numbers.
  - c) Discuss 8051 addressing modes with example.
  - d) Draw and explain port structure in 8051.
  - e) Explain modes of serial communication on 8051
- Q.3 Attempt any two of the following questions. 12**
- a) Interface DAC 0808 to 8051. Write an ALP or C program to generate square wave if switch is pressed else generate triangular wave.
  - b) Explain interrupts in 8051 with their vector addresses, causes, flags affected, and priorities.
  - c) Interface LCD to 8051. Write an ALP or C program to display "OK" on second line.

**Section – II**

- Q.4 Attempt any four of the following questions. 16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 2 in PIC 16F877
- Q.5 Attempt any two of the following question. 12**
- a) Explain the following instructions with their syntax and suitable example.
    - 1) BTFSS
    - 2) DECFSZ
    - 3) RETLW
    - 4) IORWF
  - b) How do you use the PORT D as PSP? Explain the different control signals and flags used in PSP communication.
  - c) Interface DAC to PIC 16F877 and write a program to generate a square wave and triangular wave.

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data 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) In 8051 which interrupt has highest priority?
  - a) IE1
  - b) TF0
  - c) IE0
  - d) TF1
- 2) To transfer a data serially by using TXD pin of 8051, the data must be placed in \_\_\_\_\_.
  - a) SCON
  - b) SMOD
  - c) SBUF
  - d) PCON
- 3) What is the address range of SFR Register bank in 8051?
  - a) 00H-77H
  - b) 40H-80H
  - c) 80H-7FH
  - d) 80H-FFH
- 4) The PIC 16F877 has \_\_\_\_\_ on chip flash program memory.
  - a) 4K x 8 bytes
  - b) 4K x 14 words
  - c) 8K x 8 bytes
  - d) 8K x 14 words
- 5) The PIC 16F877 has \_\_\_\_\_ I/O ports.
  - a) 4
  - b) 5
  - c) 6
  - d) 3
- 6) The PIC 16F877 has a \_\_\_\_\_ level deep x \_\_\_\_\_ bit wide hardware stack.
  - a) 8, 13
  - b) 13, 8
  - c) 8, 12
  - d) 12, 8
- 7) What is the address of the last location of on-chip flash program memory for PIC 16F877?
  - a) 0FFF h
  - b) 1FFF h
  - c) FFFF h
  - d) 7FFF h
- 8) The instruction "movlw D'200" loads the W register with \_\_\_\_\_.
  - a) 200h
  - b) C8h
  - c) 8C h
  - d) 11011000
- 9) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
  - a) Timer 0
  - b) Timer 2
  - c) Timer 1
  - d) Timer 3

- 10) The PIC 16F877 has \_\_\_\_\_ bytes on chip EEPROM data memory.
- |        |        |
|--------|--------|
| a) 192 | b) 128 |
| c) 368 | d) 256 |
- 11) 8051 has \_\_\_\_\_ parallel I/O ports.
- |      |      |
|------|------|
| a) 2 | b) 3 |
| c) 4 | d) 5 |
- 12) How many timers are available in 8051?
- |      |      |
|------|------|
| a) 2 | b) 3 |
| c) 5 | d) 4 |
- 13) Which of the following instruction will move the number 10H to Accumulator?
- |                |                 |
|----------------|-----------------|
| a) MOV A, #10H | b) MOV A, 10H   |
| c) MOV A, P10  | d) MOV A, @10H4 |
- 14) MOVC instruction uses following operands.
- |                  |                    |
|------------------|--------------------|
| a) PC only       | b) A and A + PC    |
| c) A and Ri + PC | d) A and Ri + DPTR |

<b>Seat No.</b>	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.  
 3) Assume suitable data whenever necessary.

**Section – I**

- Q.2 Attempt any four of the following questions. 16**
- a) Differentiate between microprocessor and microcontroller.
  - b) Write a program to add five BCD numbers.
  - c) Discuss 8051 addressing modes with example.
  - d) Draw and explain port structure in 8051.
  - e) Explain modes of serial communication on 8051
- Q.3 Attempt any two of the following questions. 12**
- a) Interface DAC 0808 to 8051. Write an ALP or C program to generate square wave if switch is pressed else generate triangular wave.
  - b) Explain interrupts in 8051 with their vector addresses, causes, flags affected, and priorities.
  - c) Interface LCD to 8051. Write an ALP or C program to display "OK" on second line.

**Section – II**

- Q.4 Attempt any four of the following questions. 16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 2 in PIC 16F877
- Q.5 Attempt any two of the following question. 12**
- a) Explain the following instructions with their syntax and suitable example.
    - 1) BTFSS
    - 2) DECFSSZ
    - 3) RETLW
    - 4) IORWF
  - b) How do you use the PORT D as PSP? Explain the different control signals and flags used in PSP communication.
  - c) Interface DAC to PIC 16F877 and write a program to generate a square wave and triangular wave.

Seat No.	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day &amp; 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 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 PIC 16F877 has a \_\_\_\_ level deep x \_\_\_\_ bit wide hardware stack.
  - a) 8, 13
  - b) 13, 8
  - c) 8, 12
  - d) 12, 8
- 2) What is the address of the last location of on-chip flash program memory for PIC 16F877?
  - a) 0FFF h
  - b) 1FFF h
  - c) FFFF h
  - d) 7FFF h
- 3) The instruction "movlw D'200" loads the W register with \_\_\_\_\_.
  - a) 200h
  - b) C8h
  - c) 8C h
  - d) 11011000
- 4) In PIC 16F877 the \_\_\_\_\_ module is with prescaler and postscaler.
  - a) Timer 0
  - b) Timer 2
  - c) Timer 1
  - d) Timer 3
- 5) The PIC 16F877 has \_\_\_\_\_ bytes on chip EEPROM data memory.
  - a) 192
  - b) 128
  - c) 368
  - d) 256
- 6) 8051 has \_\_\_\_\_ parallel I/O ports.
  - a) 2
  - b) 3
  - c) 4
  - d) 5
- 7) How many timers are available in 8051?
  - a) 2
  - b) 3
  - c) 5
  - d) 4
- 8) Which of the following instruction will move the number 10H to Accumulator?
  - a) MOV A, #10H
  - b) MOV A, 10H
  - c) MOV A, P10
  - d) MOV A, @10H4
- 9) MOVC instruction uses following operands.
  - a) PC only
  - b) A and A + PC
  - c) A and Ri + PC
  - d) A and Ri + DPTR
- 10) In 8051 which interrupt has highest priority?
  - a) IE1
  - b) TF0
  - c) IE0
  - d) TF1

- 11) To transfer a data serially by using TXD pin of 8051, the data must be placed in \_\_\_\_\_.
- |         |         |
|---------|---------|
| a) SCON | b) SMOD |
| c) SBUF | d) PCON |
- 12) What is the address range of SFR Register bank in 8051?
- |            |            |
|------------|------------|
| a) 00H-77H | b) 40H-80H |
| c) 80H-7FH | d) 80H-FFH |
- 13) The PIC 16F877 has \_\_\_\_\_ on chip flash program memory.
- |                 |                  |
|-----------------|------------------|
| a) 4K x 8 bytes | b) 4K x 14 words |
| c) 8K x 8 bytes | d) 8K x 14 words |
- 14) The PIC 16F877 has \_\_\_\_\_ I/O ports.
- |      |      |
|------|------|
| a) 4 | b) 5 |
| c) 6 | d) 3 |



<b>Seat No.</b>	
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**T.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROCONTROLLERS**

Day & Date: Monday, 25-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to right indicate full marks.  
 3) Assume suitable data whenever necessary.

**Section – I**

- Q.2 Attempt any four of the following questions. 16**
- a) Differentiate between microprocessor and microcontroller.
  - b) Write a program to add five BCD numbers.
  - c) Discuss 8051 addressing modes with example.
  - d) Draw and explain port structure in 8051.
  - e) Explain modes of serial communication on 8051
- Q.3 Attempt any two of the following questions. 12**
- a) Interface DAC 0808 to 8051. Write an ALP or C program to generate square wave if switch is pressed else generate triangular wave.
  - b) Explain interrupts in 8051 with their vector addresses, causes, flags affected, and priorities.
  - c) Interface LCD to 8051. Write an ALP or C program to display "OK" on second line.

**Section – II**

- Q.4 Attempt any four of the following questions. 16**
- a) Draw and explain memory organization in PIC 16F877.
  - b) Explain W, FSR, INDF, PCL, PCLATH registers in PIC.
  - c) Explain addressing modes in PIC 16F877.
  - d) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.
  - e) Explain operation of Timer 2 in PIC 16F877
- Q.5 Attempt any two of the following question. 12**
- a) Explain the following instructions with their syntax and suitable example.
    - 1) BTFSS
    - 2) DECFSSZ
    - 3) RETLW
    - 4) IORWF
  - b) How do you use the PORT D as PSP? Explain the different control signals and flags used in PSP communication.
  - c) Interface DAC to PIC 16F877 and write a program to generate a square wave and triangular wave.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INDUSTRIAL ELECTRONICS**

Day & Date: Tuesday, 26-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- 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 maximum marks

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) To protect thyristor from large  $\frac{di}{dt}$  during turn on \_\_\_\_\_.  
 a) RC circuit is connected across it  
 b) Inductor is connected in series with it  
 c) diode is connected in series  
 d) RC circuit with diode across it
- 2) Thyristor is a \_\_\_\_\_ device.  
 a) latching  
 b) bilateral  
 c) latch proof  
 d) voltage controlled
- 3) The type of commutation when the load is commutated by transferring its load current to another incoming thyristor is \_\_\_\_\_.  
 a) class A or load commutation  
 b) class B or resonant commutation  
 c) class C or complementary commutation  
 d) class D or impulse commutation
- 4) The average load current supplied by a thyristor depends on \_\_\_\_\_.  
 a) firing angle  
 b) firing frequency  
 c) magnitude of gate current  
 d) all above
- 5) Average value of output voltage for single phase fully controlled bridge converter with inductive load when  $\alpha$  is zero.  
 a)  $\frac{V_m}{\sqrt{2}}$   
 b)  $\frac{2V_m}{\pi}$   
 c)  $0.707V_m$   
 d) both a & c
- 6) DIAC & TRIAC both are \_\_\_\_\_.  
 a) AC switch  
 b) DC switch  
 c) Mechanical switch  
 d) None of above
- 7) The temperature coefficient of resistivity of an IGBT is \_\_\_\_\_.  
 a) Negative  
 b) Positive  
 c) Flat  
 d) Both a & b
- 8) The combined package of LED & photodiode is known as \_\_\_\_\_.  
 a) optocouper  
 b) optoisolator  
 c) optically coupled isolator  
 d) all above

- 9) The UJT may be used as \_\_\_\_\_.  
a) A amplifier  
b) A sawtooth generator  
c) A rectifier  
d) None of the above
- 10) Which of the following PNP device has two gate terminal?  
a) SCS  
b) SUS  
c) LASCR  
d) PUT
- 11) A SMPS operating at 20KHz to 100KHz range uses main switching power device \_\_\_\_\_.  
a) SCR  
b) Transistor  
c) Thyristor  
d) MOSFET
- 12) The output voltage of buck converter is \_\_\_\_\_.  
a) Less than input  
b) Greater than input  
c) Equal to input  
d) None of above
- 13) In \_\_\_\_\_, the heating is uniform throughout workpiece.  
a) Dielectric heating  
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- 14) In flyback converter, energy is transformed to transformer secondary \_\_\_\_\_.  
a) during a time when transistor is OFF  
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
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Max. Marks: 56

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**Section – I**

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

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  - 1) What is firing angle to be maintained for converter?
  - 2) Calculate RMS out voltage.
- d) Explain working of single phase dual converter for non circulating current mode.
- e) Sketch the cross sectional view of N channel E-MOSFET, explain its operation and characteristics.

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

- a) Explain following methods of over voltage protections circuits.
  - 1) Snubber circuits for dv/dt suppression
  - 2) Non linear surge suppressor
  - 3) Electronic crowbar circuits
- b) Explain the Single phase fully controlled bridge converter with inductive load. Derive an expression for average load voltage and RMS load voltage. Draw neat waveform for  $\alpha = 60^\circ$
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**Section – II**

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- a) Explain PUT as a relaxation oscillator. Derive an expression for frequency of oscillation.
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
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**INDUSTRIAL ELECTRONICS**

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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
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No.

**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**VLSI DESIGN**

Day & Date: Wednesday, 27-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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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 test bench is used \_\_\_\_\_.
  - a) Verify the functionality of a design
  - b) To generate primitives
  - c) To generate net list
  - d) None of above
- 2) The vhdl statement `clk<= not clk after 5 ns` generates a clk with duty cycle \_\_\_\_\_.
  - a) 5 %
  - b) 50 %
  - c) 95 %
  - d) None of these
- 3) Which of the following is a valid signal declaration?
  - a) `signal x : std_logic ='2'`
  - b) `signal x<=5;`
  - c) `signal x :=5;`
  - d) `signal x : std_logic:='1';`
- 4) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
  - a) Generate
  - b) Attribute
  - c) Generics
  - d) Signals
- 5) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time?  
`X<= 4 after 5 ns;`
  - a) 10 ns;
  - b) 10 ns +  $\Delta$
  - c) 5 ns
  - d) 5 ns +  $\Delta$
- 6) The weak 1 is represented in IEEE 1164, 9 valued logic is represented by \_\_\_\_\_.
  - a) 'W'
  - b) 'H'
  - c) 'X'
  - d) 'I'
- 7) Assuming the left operand as BIT – vector, "1001010" s11 2 is \_\_\_\_\_.
  - a) "0101010"
  - b) "0101000"
  - c) "0101011"
  - d) None of these
- 8) The CPLD contains several PLD blocks and \_\_\_\_\_.
  - a) AND-OR arrays
  - b) A language compiler
  - c) Field programmable switches
  - d) A global interconnect matrix



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**Section – I**

**Q.2 Solve any four of the following question. 16**

- a) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- b) Explain the transport and inertial delays in VHDL.
- c) Write VHDL code for 6 bit parity checker circuit.
- d) Explain following statement of VHDL with suitable example-
  - 1) Loop statements
  - 2) When else
- e) Write VHDL code for JK flip flop with asynchronous reset.

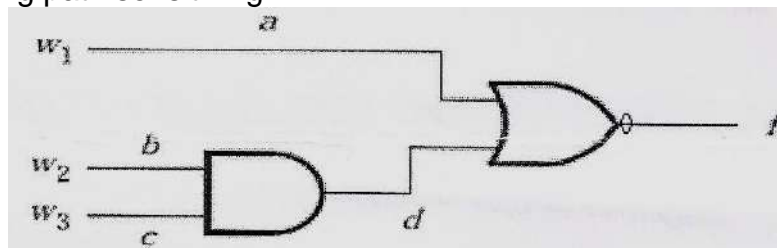
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- a) What are the major differences between VHDL functions and VHDL procedure? Write VHDL function for 8 bit parity generator.
- b) Write VHDL code for 4:1 multiplexer with structural architecture. Also write the test bench for testing it.
- c) Write VHDL code for a Moore FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II**

**Q.4 Solve any four of the following question. 16**

- a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- b) Explain place and route process of EDA tools.
- c) Explain the CMOS noise margin in detail.
- d) Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



- e) Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Attempt any two of the following question. 12**

- a) Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- b) Explain in detail simulation steps in RTL simulation.
- c) Draw and Explain DC characteristics of CMOS Inverter.



Seat  
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  - c) Field programmable switches
  - d) A global interconnect matrix
- 2) No. of flip-flops / CLB in FPGA XC4000 is \_\_\_\_\_.
  - a) 4
  - b) 2
  - c) 6
  - d) 1
- 3) CMOS logic consists of \_\_\_\_\_.
  - a) Pull up network
  - b) pull down network
  - c) Both a) and b)
  - d) None of above
- 4) Noise margin of CMOS inverter is not function of \_\_\_\_\_.
  - a) W/L of MOS
  - b)  $B_n/B_p$
  - c)  $t_{ox}$
  - d) all of above
- 5) Boundary Scan technique consists of \_\_\_\_\_.
  - a) Scan path testing port
  - b) Test Access port
  - c) Both a and b
  - d) None of above
- 6) In a CMOS inverter with  $V_{tn} < V_{in} < V_{DD} / 2$ , the states of p-device and n-device are \_\_\_\_\_.
  - a) saturated, nonsaturated
  - b) nonsaturated, saturated
  - c) nonsaturated, cutoff
  - d) none of these
- 7) Input of synthesis process are \_\_\_\_\_.
  - a) RTL VHDL description
  - b) Circuit constraints are attributes design
  - c) Technology library
  - d) All of above
- 8) A test bench is used \_\_\_\_\_.
  - a) Verify the functionality of a design
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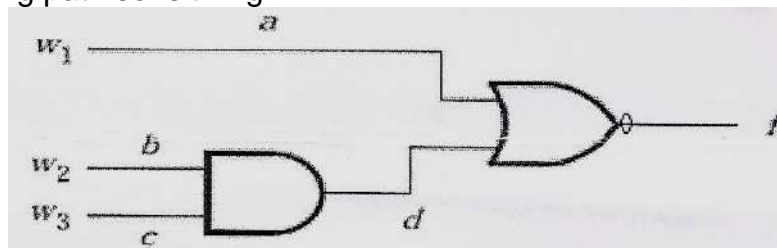
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- c) Explain the CMOS noise margin in detail.
- d) Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



- e) Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Attempt any two of the following question. 12**

- a) Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- b) Explain in detail simulation steps in RTL simulation.
- c) Draw and Explain DC characteristics of CMOS Inverter.



- 10) Input of synthesis process are \_\_\_\_\_.  
a) RTL VHDL description  
b) Circuit constraints are attributes design  
c) Technology library  
d) All of above
- 11) A test bench is used \_\_\_\_\_.  
a) Verify the functionality of a design  
b) To generate primitives  
c) To generate net list  
d) None of above
- 12) The vhdl statement `clk<= not clk after 5 ns` generates a clk with duty cycle \_\_\_\_\_.  
a) 5 %  
b) 50 %  
c) 95 %  
d) None of these
- 13) Which of the following is a valid signal declaration?  
a) `signal x : std_logic = '2'`  
b) `signal x<=5;`  
c) `signal x :=5;`  
d) `signal x : std_logic:= '1';`
- 14) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?  
a) Generate  
b) Attribute  
c) Generics  
d) Signals

Seat  
No.

**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**VLSI DESIGN**

Day & Date: Wednesday, 27-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following question. 16**

- Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- Explain the transport and inertial delays in VHDL.
- Write VHDL code for 6 bit parity checker circuit.
- Explain following statement of VHDL with suitable example-
  - Loop statements
  - When else
- Write VHDL code for JK flip flop with asynchronous reset.

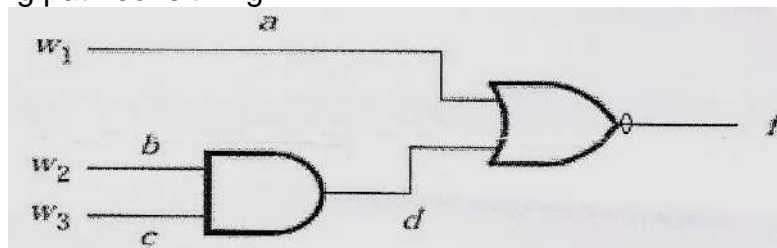
**Q.3 Solve any two of the following question. 12**

- What are the major differences between VHDL functions and VHDL procedure? Write VHDL function for 8 bit parity generator.
- Write VHDL code for 4:1 multiplexer with structural architecture. Also write the test bench for testing it.
- Write VHDL code for a Moore FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II**

**Q.4 Solve any four of the following question. 16**

- Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- Explain place and route process of EDA tools.
- Explain the CMOS noise margin in detail.
- Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



- Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Attempt any two of the following question. 12**

- Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- Explain in detail simulation steps in RTL simulation.
- Draw and Explain DC characteristics of CMOS Inverter.

Seat  
No.

**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**VLSI DESIGN**

Day & Date: Wednesday, 27-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) CMOS logic consists of \_\_\_\_\_.
  - a) Pull up network
  - b) pull down network
  - c) Both a) and b)
  - d) None of above
- 2) Noise margin of CMOS inverter is not function of \_\_\_\_\_.
  - a) W/L of MOS
  - b)  $B_n/B_p$
  - c)  $t_{ox}$
  - d) all of above
- 3) Boundary Scan technique consists of \_\_\_\_\_.
  - a) Scan path testing port
  - b) Test Access port
  - c) Both a and b
  - d) None of above
- 4) In a CMOS inverter with  $V_{tn} < V_{in} < V_{DD} / 2$ , the states of p-device and n-device are \_\_\_\_\_.
  - a) saturated, nonsaturated
  - b) nonsaturated, saturated
  - c) nonsaturated, cutoff
  - d) none of these
- 5) Input of synthesis process are \_\_\_\_\_.
  - a) RTL VHDL description
  - b) Circuit constraints are attributes design
  - c) Technology library
  - d) All of above
- 6) A test bench is used \_\_\_\_\_.
  - a) Verify the functionality of a design
  - b) To generate primitives
  - c) To generate net list
  - d) None of above
- 7) The vhdl statement `clk<= not clk after 5 ns` generates a clk with duty cycle \_\_\_\_\_.
  - a) 5 %
  - b) 50 %
  - c) 95 %
  - d) None of these
- 8) Which of the following is a valid signal declaration?
  - a) `signal x : std_logic = '2'`
  - b) `signal x<=5;`
  - c) `signal x :=5;`
  - d) `signal x : std_logic:= '1';`
- 9) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
  - a) Generate
  - b) Attribute
  - c) Generics
  - d) Signals

- 10) When the following signal assignment statement executes at 5 ns, the new value will be assigned to signal at what time?  
 $X \leq 4$  after 5 ns;
- a) 10 ns;
  - b)  $10 \text{ ns} + \Delta$
  - c) 5 ns
  - d)  $5 \text{ ns} + \Delta$
- 11) The weak 1 is represented in IEEE 1164, 9 valued logic is represented by \_\_\_\_\_.
- a) 'W'
  - b) 'H'
  - c) 'X'
  - d) 'I'
- 12) Assuming the left operand as BIT – vector, "1001010" s11 2 is \_\_\_\_\_.
- a) "0101010"
  - b) "0101000"
  - c) "0101011"
  - d) None of these
- 13) The CPLD contains several PLD blocks and \_\_\_\_\_.
- a) AND-OR arrays
  - b) A language compiler
  - c) Field programmable switches
  - d) A global interconnect matrix
- 14) No. of flip-flops / CLB in FPGA XC4000 is \_\_\_\_\_.
- a) 4
  - b) 2
  - c) 6
  - d) 1



Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**VLSI DESIGN**

Day & Date: Wednesday, 27-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I**

**Q.2 Solve any four of the following question. 16**

- Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?
- Explain the transport and inertial delays in VHDL.
- Write VHDL code for 6 bit parity checker circuit.
- Explain following statement of VHDL with suitable example-
  - Loop statements
  - When else
- Write VHDL code for JK flip flop with asynchronous reset.

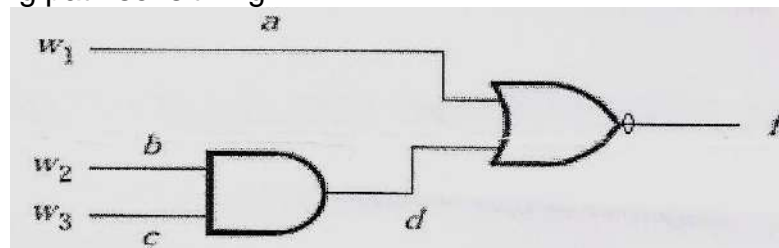
**Q.3 Solve any two of the following question. 12**

- What are the major differences between VHDL functions and VHDL procedure? Write VHDL function for 8 bit parity generator.
- Write VHDL code for 4:1 multiplexer with structural architecture. Also write the test bench for testing it.
- Write VHDL code for a Moore FSM to detect the sequence 110 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

**Section – II**

**Q.4 Solve any four of the following question. 16**

- Explain the architecture of macrocell in Xilinx 9500 series CPLD.
- Explain place and route process of EDA tools.
- Explain the CMOS noise margin in detail.
- Explain path sensitizing. Obtain the complete test set for circuit shown below using path sensitizing.



- Draw and explain the schematic arrangement for testing sequential circuits.

**Q.5 Attempt any two of the following question. 12**

- Draw and Explain Xilinx Spartan 4000 FPGA architecture.
- Explain in detail simulation steps in RTL simulation.
- Draw and Explain DC characteristics of CMOS Inverter.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) The transmission, \_\_\_\_\_.
  - a) converts rotary to linear motion
  - b) optimizes the transfer of engine power to the drivetrain
  - c) has four forward speeds and one reverse
  - d) automatically selects the highest gear ratio
- 2) What does a microcomputer use to interface with other systems?
  - a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above
- 3) What advantages does digital signal processing have over analog signal processing?
  - a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
  - d) all of the above
- 4) What does a sensor do?
  - a) it selects transmission gear ratio
  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver
- 5) A thermistor is \_\_\_\_\_.
  - a) a semiconductor temperature sensor
  - b) a device for regulating engine temperature
  - c) a temperature control system for the passenger
  - d) a new type of transistor
- 6) The purpose of a rectifier in an alternator is to \_\_\_\_\_.
  - a) change AC to DC voltage
  - b) Control alternator output current
  - c) change DC to AC voltage
  - d) control alternator output voltage
- 7) 'Star' and 'Delta' are types of \_\_\_\_\_.
  - a) rotor winding
  - b) stator winding
  - c) field winding
  - d) Regulator winding

- 8) The main advantage of using light emitting diodes (LEDs) in vehicle lighting is \_\_\_\_\_.  
a) the variety of colours available    b) that they produce whiter light  
c) their long life    d) all of the above
- 9) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.  
a) 1.000    b) 1.100  
c) 1.280    d) 1.500
- 10) A window lift motor drives through a worm gear because this: \_\_\_\_\_.  
a) increases speed and torque  
b) reduces speed and torque  
c) increases speed and reduces torque  
d) reduces speed and increases torque

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

- 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 question. 12**
- a) Discuss the advantages of digital over analog.
  - b) Write a note on electronic engine control system
  - c) Write a note on temperature sensor used in automotive.
  - d) Write a note on selection of appropriate sensor for various auto parameters.
- Q.3 Attempt any one of the following question. 08**
- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
  - d) What are the modern trends in automotive diagnostics system?
  - e) Explain transmission control system related to automobile engine.
- Q.5 Attempt any one: 08**
- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
  - b) What are the types of communication buses used in automobile? Describe any one in detail.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) The purpose of a rectifier in an alternator is to \_\_\_\_\_.  
 a) change AC to DC voltage  
 b) Control alternator output current  
 c) change DC to AC voltage  
 d) control alternator output voltage
- 2) 'Star' and 'Delta' are types of \_\_\_\_\_.  
 a) rotor winding  
 b) stator winding  
 c) field winding  
 d) Regulator winding
- 3) The main advantage of using light emitting diodes (LEDs) in vehicle lighting is \_\_\_\_\_.  
 a) the variety of colours available  
 b) that they produce whiter light  
 c) their long life  
 d) all of the above
- 4) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.  
 a) 1.000  
 b) 1.100  
 c) 1.280  
 d) 1.500
- 5) A window lift motor drives through a worm gear because this: \_\_\_\_\_.  
 a) increases speed and torque  
 b) reduces speed and torque  
 c) increases speed and reduces torque  
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- 6) The transmission, \_\_\_\_\_.  
 a) converts rotary to linear motion  
 b) optimizes the transfer of engine power to the drivetrain  
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- 7) What does a microcomputer use to interface with other systems?  
 a) parallel interface  
 b) analog-to-digital converter  
 c) digital-to-analog converter  
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- 8) What advantages does digital signal processing have over analog signal processing?
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  - b) it measures some variable
  - c) it is an output device
  - d) it sends signals to the driver
- 10) A thermistor is \_\_\_\_\_.
- a) a semiconductor temperature sensor
  - b) a device for regulating engine temperature
  - c) a temperature control system for the passenger
  - d) a new type of transistor

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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

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

- Q.2 Attempt any three of the following question. 12**  
 a) Discuss the advantages of digital over analog.  
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- Q.3 Attempt any one of the following question. 08**  
 a) Explain the working of engines with major components and neat sketch.  
 b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**  
 a) Explain digital instrumentation system in automobile.  
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- a) the variety of colours available
  - b) that they produce whiter light
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  - d) all of the above

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.  
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  - d) Write a note on selection of appropriate sensor for various auto parameters.
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- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
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- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
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Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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) What advantages does digital signal processing have over analog signal processing?
  - a) digital is more precise
  - b) digital doesn't drift with time and temperature
  - c) the same digital hardware can be used in many filters
  - d) all of the above
- 2) What does a sensor do?
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- 3) A thermistor is \_\_\_\_\_.
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  - a) change AC to DC voltage
  - b) Control alternator output current
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a) rotor winding	b) stator winding
c) field winding	d) Regulator winding
- 6) The main advantage of using light emitting diodes (LEDs) in vehicle lighting is \_\_\_\_\_.
 

a) the variety of colours available	b) that they produce whiter light
c) their long life	d) all of the above
- 7) The electrolyte for a fully charged lead-acid battery has a relative density of approximately \_\_\_\_\_.
 

a) 1.000	b) 1.100
c) 1.280	d) 1.500

- 8) A window lift motor drives through a worm gear because this: \_\_\_\_\_.
- a) increases speed and torque
  - b) reduces speed and torque
  - c) increases speed and reduces torque
  - d) reduces speed and increases torque
- 9) The transmission, \_\_\_\_\_.
- a) converts rotary to linear motion
  - b) optimizes the transfer of engine power to the drivetrain
  - c) has four forward speeds and one reverse
  - d) automatically selects the highest gear ratio
- 10) What does a microcomputer use to interface with other systems?
- a) parallel interface
  - b) analog-to-digital converter
  - c) digital-to-analog converter
  - d) all of the above

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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUTOMOTIVE ELECTRONICS**

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

Max. Marks: 40

- 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 question. 12**
- a) Discuss the advantages of digital over analog.
  - b) Write a note on electronic engine control system
  - c) Write a note on temperature sensor used in automotive.
  - d) Write a note on selection of appropriate sensor for various auto parameters.
- Q.3 Attempt any one of the following question. 08**
- a) Explain the working of engines with major components and neat sketch.
  - b) Write a note on steps of Analog-to-Digital Converter

**Section – II**

- Q.4 Attempt any three of the following question. 12**
- a) Explain digital instrumentation system in automobile.
  - b) Draw basic drive circuits for pneumatic actuator and explain it in brief.
  - c) What is basic wiring system and multiplex wiring system used in automobile?
  - d) What are the modern trends in automotive diagnostics system?
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- Q.5 Attempt any one: 08**
- a) What is anti-lock braking system? Draw block diagram of ABS and describe its working.
  - b) What are the types of communication buses used in automobile? Describe any one in detail.

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ROBOTICS**

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

Max. Marks: 50

- Instructions:** 1) All questions are compulsory.  
2) Figures to right indicate maximum marks.  
3) Assume suitable data wherever necessary.

**Q.1 Attempt any four. 20**

- a) What are the different key issues for locomotion in mobile robots?
- b) Explain spray painting application of robot with neat diagram.
- c) With neat sketch explain working of vision-based sensors.
- d) List down the types of end effectors. Discuss mechanical gripper with neat diagram.
- e) List different robot programming methods.

**Q.2 Attempt any three. 30**

- a) With neat sketch explain wheeled mobile robots.
- b) Describe the steps involved in preventive maintenance.
- c) Describe operations and functions of machine vision in detail.
- d) Classify robots based on control methods. Explain non servo controlled robots.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicates 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 signal generators, \_\_\_\_\_.  
 a) Energy is created  
 b) Energy is generated  
 c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency  
 d) All the above
- 2) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.  
 a) High frequencies  
 b) Medium frequencies  
 c) DC  
 d) Low frequencies
- 3) Which of the below is not a building block of frequency measurement?  
 a) Gates  
 b) Shift registers  
 c) Counters  
 d) Schmitt trigger
- 4) \_\_\_\_\_ is used to scale down the input gains so as to match the input signal level of the device.  
 a) Amplifier  
 b) Attenuator  
 c) Converter  
 d) Multiplexer
- 5) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.  
 a) measurement  
 b) resolution  
 c) Precision  
 d) accuracy
- 6) Take odd man out - speed, fidelity, sensitivity, lag \_\_\_\_\_.  
 a) Speed  
 b) fidelity  
 c) sensitivity  
 d) lag
- 7) \_\_\_\_\_ is a measure of signal impurity.  
 a) Fidelity  
 b) distortion  
 c) Error  
 d) power
- 8) The instrument used to study relationship of many signals at one glance is \_\_\_\_\_ analyzer.  
 a) logic  
 b) FFT  
 c) Spectrum  
 d) distortion

- 9) The ultrasonic transmitter uses \_\_\_\_\_ effect.
- |                  |                          |
|------------------|--------------------------|
| a) piezoelectric | b) reverse piezoelectric |
| c) load-cell     | d) hall                  |
- 10) Which of below is a part of typical DAS \_\_\_\_\_?
- |               |                        |
|---------------|------------------------|
| a) transducer | b) signal conditioning |
| c) Buffer     | d) all of these        |



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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- 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 one.** **08**  
a) With suitable example show working of universal counter.  
b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
a) Comment on standard deviation and its significance in measurements.  
b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
c) How to protect from electrostatic discharge?  
d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
a) Draw and explain FFT analyzer.  
b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
a) Comment on desirable characteristics of data logger.  
b) Differentiate between a sensor and smart sensor.  
c) What is radiometric conversion?  
d) How to plot instantaneous relationship between two signals- X and Y?



- 9) \_\_\_\_\_ is used to scale down the input gains so as to match the input signal level of the device.
- |              |                |
|--------------|----------------|
| a) Amplifier | b) Attenuator  |
| c) Converter | d) Multiplexer |
- 10) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.
- |                |               |
|----------------|---------------|
| a) measurement | b) resolution |
| c) Precision   | d) accuracy   |

<b>Seat No.</b>	
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<b>Set</b>	<b>Q</b>
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicates full marks.  
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**Section – I**

- Q.2 Solve any one.** **08**  
 a) With suitable example show working of universal counter.  
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 a) Comment on standard deviation and its significance in measurements.  
 b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
 c) How to protect from electrostatic discharge?  
 d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
 a) Draw and explain FFT analyzer.  
 b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
 a) Comment on desirable characteristics of data logger.  
 b) Differentiate between a sensor and smart sensor.  
 c) What is radiometric conversion?  
 d) How to plot instantaneous relationship between two signals- X and Y?

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicates 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) The ultrasonic transmitter uses \_\_\_\_\_ effect.
  - a) piezoelectric
  - b) reverse piezoelectric
  - c) load-cell
  - d) hall
- 2) Which of below is a part of typical DAS \_\_\_\_\_?
  - a) transducer
  - b) signal conditioning
  - c) Buffer
  - d) all of these
- 3) In signal generators, \_\_\_\_\_.
  - a) Energy is created
  - b) Energy is generated
  - c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency
  - d) All the above
- 4) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.
  - a) High frequencies
  - b) Medium frequencies
  - c) DC
  - d) Low frequencies
- 5) Which of the below is not a building block of frequency measurement?
  - a) Gates
  - b) Shift registers
  - c) Counters
  - d) Schmitt trigger
- 6) \_\_\_\_\_ is used to scale down the input gains so as to match the input signal level of the device.
  - a) Amplifier
  - b) Attenuator
  - c) Converter
  - d) Multiplexer
- 7) The degree of closeness of a measurement compared to the expected value is \_\_\_\_\_.
  - a) measurement
  - b) resolution
  - c) Precision
  - d) accuracy
- 8) Take odd man out - speed, fidelity, sensitivity, lag \_\_\_\_\_.
  - a) Speed
  - b) fidelity
  - c) sensitivity
  - d) lag

- 9) \_\_\_\_\_ is a measure of signal impurity.
- |             |               |
|-------------|---------------|
| a) Fidelity | b) distortion |
| c) Error    | d) power      |
- 10) The instrument used to study relationship of many signals at one glance is \_\_\_\_\_ analyzer.
- |             |               |
|-------------|---------------|
| a) logic    | b) FFT        |
| c) Spectrum | d) distortion |

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- 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 one.** **08**  
a) With suitable example show working of universal counter.  
b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
a) Comment on standard deviation and its significance in measurements.  
b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
c) How to protect from electrostatic discharge?  
d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
a) Draw and explain FFT analyzer.  
b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
a) Comment on desirable characteristics of data logger.  
b) Differentiate between a sensor and smart sensor.  
c) What is radiometric conversion?  
d) How to plot instantaneous relationship between two signals- X and Y?





- 9) In signal generators, \_\_\_\_\_.
- a) Energy is created
  - b) Energy is generated
  - c) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency
  - d) All the above
- 10) Period measurement is done in frequency meters for achieving high accuracy in the case \_\_\_\_\_.
- a) High frequencies
  - b) Medium frequencies
  - c) DC
  - d) Low frequencies

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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS INSTRUMENTATION**

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

Max. Marks: 40

- 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 one.** **08**  
a) With suitable example show working of universal counter.  
b) What are the different static errors that may occur in measurements?
- Q.3 Solve any three.** **12**  
a) Comment on standard deviation and its significance in measurements.  
b) For a DC output of a strain gauge what type of signal conditioning you recommend?  
c) How to protect from electrostatic discharge?  
d) Draw and explain digital pH meter.

**Section – II**

- Q.4 Solve any one.** **08**  
a) Draw and explain FFT analyzer.  
b) Suggest (block diagram) a set up for measurement of blood flow.
- Q.5 Solve any three.** **12**  
a) Comment on desirable characteristics of data logger.  
b) Differentiate between a sensor and smart sensor.  
c) What is radiometric conversion?  
d) How to plot instantaneous relationship between two signals- X and Y?

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.

**MCQ/Objective Type Questions**

Duration: 20 Minutes

Marks: 10

**Q.1 Choose the correct alternatives from the options and rewrite the sentence. 10**

- 1) AGUI \_\_\_\_\_.
  - a) uses buttons, menus, and icons
  - b) should be easy for a user to manipulate
  - c) both (a) and (b)
  - d) stands for Graphic Use Interaction
- 2) Which does the solution explorer not display?
  - a) Form Properties
  - b) Reference Folder
  - c) Form File
  - d) Assemble File
- 3) The member "clear" of the Array class that sets a range of array elements to zero, false or null reference is a \_\_\_\_\_ method.
  - a) Shared
  - b) Method
  - c) Class
  - d) Object
- 4) An object is composed of \_\_\_\_\_.
  - a) properties
  - b) Methods
  - c) Events
  - d) All of the above
- 5) The CancelButton property belongs to which object?
  - a) Form
  - b) Button
  - c) Label
  - d) TextBox
- 6) Which is not a property of the Common control class?
  - a) Font
  - b) Show
  - c) ForeColor
  - d) BackColor
- 7) VB.Net is \_\_\_\_\_.
  - a) Platform Independent
  - b) Compiler Language
  - c) Forward compatibale
  - d) Backward compatible
- 8) Which of the following property of Array class in VB.NET checks whether the Array has a fixed size?
  - a) IsFixedSize
  - b) IsStatic
  - c) Length
  - d) None of the above.

- 9) Which of the following access modifier specifies that a function or Get accessor is an iterator?
- |        |             |
|--------|-------------|
| a) In  | b) Iterator |
| c) Key | d) Module   |
- 10) \_\_\_\_\_ allows custom items of information about a program element to be stored with an assembly's metadata.
- |               |               |
|---------------|---------------|
| a) Properties | b) Attributes |
| c) Methods    | d) Classes    |

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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
2) Figures to the right indicate full marks.

- Q.2** Explain multiple catch block with example? **10**
- Q.3** Explain list box and combo box with example. **10**

**OR**

Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

- Q.4 Attempt any four of the following questions. 20**
- a) Explain while and do while loops in VB.net.
  - b) Explain type casting in VB.NET.
  - c) Explain User Defined function with example.
  - d) Explain MSIL?
  - e) Explain radio button control events.

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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.

**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 is not a property of the Common control class?
  - a) Font
  - b) Show
  - c) ForeColor
  - d) BackColor
- 2) VB.Net is \_\_\_\_\_.
  - a) Platform Independent
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  - d) None of the above.
- 4) Which of the following access modifier specifies that a function or Get accessor is an iterator?
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  - b) Iterator
  - c) Key
  - d) Module
- 5) \_\_\_\_\_ allows custom items of information about a program element to be stored with an assembly's metadata.
  - a) Properties
  - b) Attributes
  - c) Methods
  - d) Classes
- 6) AGUI \_\_\_\_\_.
  - a) uses buttons, menus, and icons
  - b) should be easy for a user to manipulate
  - c) both (a) and (b)
  - d) stands for Graphic Use Interaction
- 7) Which does the solution explorer not display?
  - a) Form Properties
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  - d) Assemble File
- 8) The member "clear" of the Array class that sets a range of array elements to zero, false or null reference is a \_\_\_\_\_ method.
  - a) Shared
  - b) Method
  - c) Class
  - d) Object

- 9) An object is composed of \_\_\_\_\_.
- |               |                     |
|---------------|---------------------|
| a) properties | b) Methods          |
| c) Events     | d) All of the above |
- 10) The CancelButton property belongs to which object?
- |          |            |
|----------|------------|
| a) Form  | b) Button  |
| c) Label | d) TextBox |

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
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- Q.2** Explain multiple catch block with example? **10**
- Q.3** Explain list box and combo box with example. **10**

**OR**

Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

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- a) Explain while and do while loops in VB.net.
  - b) Explain type casting in VB.NET.
  - c) Explain User Defined function with example.
  - d) Explain MSIL?
  - e) Explain radio button control events.



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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.

**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 access modifier specifies that a function or Get accessor is an iterator?
 

a) In	b) Iterator
c) Key	d) Module
  
- 2) \_\_\_\_\_ allows custom items of information about a program element to be stored with an assembly's metadata.
 

a) Properties	b) Attributes
c) Methods	d) Classes
  
- 3) AGUI \_\_\_\_\_.
  - a) uses buttons, menus, and icons
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- 4) Which does the solution explorer not display?
 

a) Form Properties	b) Reference Folder
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a) Shared	b) Method
c) Class	d) Object
  
- 6) An object is composed of \_\_\_\_\_.
 

a) properties	b) Methods
c) Events	d) All of the above
  
- 7) The CancelButton property belongs to which object?
 

a) Form	b) Button
c) Label	d) TextBox
  
- 8) Which is not a property of the Common control class?
 

a) Font	b) Show
c) ForeColor	d) BackColor
  
- 9) VB.Net is \_\_\_\_\_.
 

a) Platform Independent	b) Compiler Language
c) Forward compatibale	d) Backward compatible

- 10) Which of the following property of Array class in VB.NET checks whether the Array has a fixed size?
- a) IsFixedSize
  - b) IsStatic
  - c) Length
  - d) None of the above.

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
2) Figures to the right indicate full marks.

**Q.2** Explain multiple catch block with example? **10**

**Q.3** Explain list box and combo box with example. **10**

**OR**

Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

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- b) Explain type casting in VB.NET.
- c) Explain User Defined function with example.
- d) Explain MSIL?
- e) Explain radio button control events.

Seat No.	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 50

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 20 minutes in answer book.  
 2) Figures to the right indicate full marks.

**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 member "clear" of the Array class that sets a range of array elements to zero, false or null reference is a \_\_\_\_\_ method.
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  - b) Method
  - c) Class
  - d) Object
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  - c) Length
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  - b) Iterator
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  - d) Classes

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  - b) Reference Folder
  - c) Form File
  - d) Assemble File

<b>Seat No.</b>	
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**T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PROGRAMMING IN VB NET**

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

Max. Marks: 40

**Instructions:** 1) Attempt all the questions.  
2) Figures to the right indicate full marks.

**Q.2** Explain multiple catch block with example? **10**

**Q.3** Explain list box and combo box with example. **10**

**OR**

Explain single dimensional array in VB.NET. Write a program to implement bubble sort. **10**

**Q.4 Attempt any four of the following questions.** **20**

- a) Explain while and do while loops in VB.net.
- b) Explain type casting in VB.NET.
- c) Explain User Defined function with example.
- d) Explain MSIL?
- e) Explain radio button control events.

Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 Morgans chopper  $t_{ON} =$  \_\_\_\_\_.
 

a) $\pi \sqrt{\frac{L}{C}}$	b) $\pi \sqrt{\frac{C}{L}}$
c) $\pi \sqrt{LC}$	d) $\pi LC$
- 2) A step up chopper has input voltage 110 V and output voltage 150 V. The value of duty cycle is \_\_\_\_\_.
 

a) 0.32	b) 0.67
c) 0.45	d) 0.266
- 3) In a 3 phase half wave controlled rectifier, when firing angle is less than 90 degree, then the average dc output voltage becomes \_\_\_\_\_.
 

a) Positive	b) Negative
c) Zero	d) None of these
- 4) A Three phase full converter operating with three phase 440V, 60Hz. The  $I_L$  is continuous & ripple free is equal to 120A. RMS value of load current is \_\_\_\_\_.
 

a) 69.28A	b) 84.85A
c) 169.7A	d) 120A
- 5) Three phase half wave controlled rectifier is connected to a 3Ø 440V, 50 Hz AC source. Output ripple frequency will be \_\_\_\_\_.
 

a) 50 Hz	b) 150 Hz
c) 300 Hz	d) 25 Hz
- 6) In \_\_\_\_\_ Commutation, charged capacitor is switched by an auxiliary SCR to commutate main SCR.
 

a) Voltage	b) Current
c) Load	d) all above
- 7) A Cycloconverters is a \_\_\_\_\_.
 

a) Frequency converter	b) AC voltage converter
c) Amplitude converter	d) None of above
- 8) In a circuit high reactive power compared to true power indicates \_\_\_\_\_.
 

a) Low power factor	b) High power factor
c) Low efficiency	d) High efficiency

- 9) In three phase bridge inverter if fundamental output frequency is 50 Hz, then frequencies of other components in the output voltage wave in Hz, would be \_\_\_\_\_.
- a) 50, 250, 350, 550, high frequencies
  - b) 50, 150, 250, 350, 450
  - c) 50, 100, 150, 200
  - d) 50Hz
- 10) Sinusoidal pwm technique eliminates \_\_\_\_\_.
- a) only one harmonic at a time
  - b) number of harmonic at a time
  - c) only even harmonics
  - d) even and odd harmonics
- 11) In \_\_\_\_\_ inverter output frequency is independent of commutating component.
- a) Parallel
  - b) Series
  - c) Modified series inverter
  - d) Both b & c
- 12) Speed control of DC motor can be obtained from \_\_\_\_\_.
- a) Step down Chopper
  - b) Four quadrant chopper
  - c) Jones chopper
  - d) All above
- 13) Speed control of three phase AC motor can be obtained from \_\_\_\_\_.
- a) Single phase Cycloconveter
  - b) Single phase bridge Inverter
  - c) Three phase bridge inverter
  - d) Three phase controlled rectifier
- 14) A single phase bridge inverter has dc input voltage  $V_s = 70V$ . Then amplitude of square wave is \_\_\_\_\_.
- a) 140
  - b) 70V
  - c) 46.67V
  - d)  $70/\sqrt{2}$



Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

**Q.2 Solve any four** **16**

- a) A Three phase controlled bridge converter is connected to 414V (rms), 3 $\phi$ , 60Hz mains. The load consists of 250V battery in series with resistor of 10 $\Omega$ . The output current of converter is 15A ripple free. Estimate average output voltage of converter, delay angle & ratings of SCRs.
- b) Show that fundamental rms value of per phase output voltage for m phase cycloconverter is  $E_{0r} = E_{ph} \frac{m}{\pi} \sin\left(\frac{\pi}{m}\right)$
- c) Explain operation of single phase bridge type cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/4$ . Sketch associated waveforms.
- d) Derive an expression for average dc voltage for three phase semiconverter with resistive load for discontinuous conduction mode. Draw voltage waveforms for  $\alpha = 120^\circ$
- e) Explain working of class E chopper with suitable circuit diagram.

**Q.3 Solve Any two** **12**

- a) Explain working of Jones chopper with associated voltage and current waveform as function of time.
- b) Explain operation of dual converter with circulating current mode with suitable waveforms. Derive an expression for circulating current.
- c) Describe DSP based firing scheme for three phase controlled rectifiers with suitable flow chart.

**Section – II**

**Q.4 Solve any four** **16**

- a) What is power factor corrector? Explain any one method for improvement of power factor.
- b) Explain single pulse width modulation technique. Derive an expression for rms output voltage.
- c) Derive an expression of RMS value of  $n^{\text{th}}$  harmonic component for single phase full bridge square wave inverter.
- d) Explain harmonics reduction techniques using stepped wave inverter.
- e) With suitable diagram explain working of three phase cycloconverter drive.

**Q.5 Attempt any two**

- a)** Explain working of  $180^\circ$  conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage with help of mathematical analysis.
- b)** Explain working of microcontroller based four quadrant closed loop control of induction motor for two different cases.
  - 1) Control action below reference speed
  - 2) Control action above reference speed
- c)** Explain with suitable block diagram the speed control of DC drive using fuzzy logic controller.





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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

**Q.2 Solve any four**

**16**

- A Three phase controlled bridge converter is connected to 414V (rms), 3 $\phi$ , 60Hz mains. The load consists of 250V battery in series with resistor of 10 $\Omega$ . The output current of converter is 15A ripple free. Estimate average output voltage of converter, delay angle & ratings of SCRs.
- Show that fundamental rms value of per phase output voltage for m phase cycloconverter is  $E_{0r} = E_{ph} \frac{m}{\pi} \sin\left(\frac{\pi}{m}\right)$
- Explain operation of single phase bridge type cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/4$ . Sketch associated waveforms.
- Derive an expression for average dc voltage for three phase semiconverter with resistive load for discontinuous conduction mode. Draw voltage waveforms for  $\alpha = 120^\circ$
- Explain working of class E chopper with suitable circuit diagram.

**Q.3 Solve Any two**

**12**

- Explain working of Jones chopper with associated voltage and current waveform as function of time.
- Explain operation of dual converter with circulating current mode with suitable waveforms. Derive an expression for circulating current.
- Describe DSP based firing scheme for three phase controlled rectifiers with suitable flow chart.

**Section – II**

**Q.4 Solve any four**

**16**

- What is power factor corrector? Explain any one method for improvement of power factor.
- Explain single pulse width modulation technique. Derive an expression for rms output voltage.
- Derive an expression of RMS value of  $n^{\text{th}}$  harmonic component for single phase full bridge square wave inverter.
- Explain harmonics reduction techniques using stepped wave inverter.
- With suitable diagram explain working of three phase cycloconverter drive.

**Q.5 Attempt any two**

- a)** Explain working of  $180^\circ$  conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage with help of mathematical analysis.
- b)** Explain working of microcontroller based four quadrant closed loop control of induction motor for two different cases.
  - 1) Control action below reference speed
  - 2) Control action above reference speed
- c)** Explain with suitable block diagram the speed control of DC drive using fuzzy logic controller.



- 9) Speed control of three phase AC motor can be obtained from\_\_\_\_\_.
- a) Single phase Cycloconverter      b) Single phase bridge Inverter  
c) Three phase bridge inverter      d) Three phase controlled rectifier
- 10) A single phase bridge inverter has dc input voltage  $V_s = 70V$ . Then amplitude of square wave is \_\_\_\_\_.
- a) 140      b) 70V  
c) 46.67V      d)  $70/\sqrt{2}$
- 11) In Morgans chopper  $t_{ON} =$  \_\_\_\_\_.
- a)  $\pi\sqrt{\frac{L}{C}}$       b)  $\pi\sqrt{\frac{C}{L}}$   
c)  $\pi\sqrt{LC}$       d)  $\pi LC$
- 12) A step up chopper has input voltage 110 V and output voltage 150 V. The value of duty cycle is \_\_\_\_\_.
- a) 0.32      b) 0.67  
c) 0.45      d) 0.266
- 13) In a 3 phase half wave controlled rectifier, when firing angle is less than 90 degree, then the average dc output voltage becomes \_\_\_\_\_.
- a) Positive      b) Negative  
c) Zero      d) None of these
- 14) A Three phase full converter operating with three phase 440V, 60Hz. The  $I_L$  is continuous & ripple free is equal to 120A. RMS value of load current is \_\_\_\_\_.
- a) 69.28A      b) 84.85A  
c) 169.7A      d) 120A



Seat No.	
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**POWER ELECTRONICS**

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Max. Marks: 56

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**Section – I**

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- c) Explain operation of single phase bridge type cycloconverter with resistive load. The frequency is  $f_o/f_s = 1/4$ . Sketch associated waveforms.
- d) Derive an expression for average dc voltage for three phase semiconverter with resistive load for discontinuous conduction mode. Draw voltage waveforms for  $\alpha = 120^\circ$
- e) Explain working of class E chopper with suitable circuit diagram.

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- a) Explain working of Jones chopper with associated voltage and current waveform as function of time.
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**Section – II**

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- a) What is power factor corrector? Explain any one method for improvement of power factor.
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Electronics Engineering  
POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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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) Sinusoidal pwm technique eliminates \_\_\_\_\_.  
a) only one harmonic at a time      b) number of harmonic at a time  
c) only even harmonics                d) even and odd harmonics
- 2) In \_\_\_\_\_ inverter output frequency is independent of commutating component.  
a) Parallel                                      b) Series  
c) Modified series inverter                d) Both b & c
- 3) Speed control of DC motor can be obtained from \_\_\_\_\_.  
a) Step down Chopper                      b) Four quadrant chopper  
c) Jones chopper                              d) All above
- 4) Speed control of three phase AC motor can be obtained from \_\_\_\_\_.  
a) Single phase Cycloconveter          b) Single phase bridge Inverter  
c) Three phase bridge inverter          d) Three phase controlled rectifier
- 5) A single phase bridge inverter has dc input voltage  $V_s = 70V$ . Then amplitude of square wave is \_\_\_\_\_.  
a) 140    b) 70V  
c) 46.67V    d)  $70/\sqrt{2}$
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a)  $\pi \sqrt{\frac{L}{C}}$     b)  $\pi \sqrt{\frac{C}{L}}$   
c)  $\pi \sqrt{LC}$                                         d)  $\pi LC$
- 7) A step up chopper has input voltage 110 V and output voltage 150 V. The value of duty cycle is \_\_\_\_\_.  
a) 0.32    b) 0.67  
c) 0.45    d) 0.266
- 8) In a 3 phase half wave controlled rectifier, when firing angle is less than 90 degree, then the average dc output voltage becomes \_\_\_\_\_.  
a) Positive                                        b) Negative  
c) Zero    d) None of these
- 9) A Three phase full converter operating with three phase 440V, 60Hz. The  $I_L$  is continuous & ripple free is equal to 120A. RMS value of load current is \_\_\_\_\_.  
a) 69.28A    b) 84.85A  
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**POWER ELECTRONICS**

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**Section – I**

**Q.2 Solve any four** **16**

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- Explain operation of dual converter with circulating current mode with suitable waveforms. Derive an expression for circulating current.
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**Section – II**

**Q.4 Solve any four** **16**

- What is power factor corrector? Explain any one method for improvement of power factor.
- Explain single pulse width modulation technique. Derive an expression for rms output voltage.
- Derive an expression of RMS value of  $n^{\text{th}}$  harmonic component for single phase full bridge square wave inverter.
- Explain harmonics reduction techniques using stepped wave inverter.
- With suitable diagram explain working of three phase cycloconverter drive.

**Q.5 Attempt any two**

- a)** Explain working of  $180^\circ$  conduction mode, three phase bridge inverter feeding star connected purely resistive load. Draw associated line and phase voltage with help of mathematical analysis.
- b)** Explain working of microcontroller based four quadrant closed loop control of induction motor for two different cases.
  - 1) Control action below reference speed
  - 2) Control action above reference speed
- c)** Explain with suitable block diagram the speed control of DC drive using fuzzy logic controller.

Seat No.	
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**B.E. (Part -I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02.30 PM To 05.30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 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) Flow control is needed to prevent\_\_\_\_\_  
 a) Bit error  
 b) Overflow of sender's buffer  
 c) Collision between sender and receiver  
 d) Overflow of receiver's buffer
- 2) This CSMA shows the best performance \_\_\_\_\_.  
 a) 1-persistent  
 b) non-persistent  
 c) p-persistent  
 d) All mentioned
- 3) NIC (Network Interface Card) is \_\_\_\_\_ layer device.  
 a) Physical  
 b) Data Link  
 c) Network  
 d) Application
- 4) The data unit in transport layer in TCP/IP is called \_\_\_\_\_.  
 a) A datagram  
 b) A segment  
 c) frame  
 d) Bit-string
- 5) Which IP Class has few hosts per network?  
 a) Class A  
 b) Class B  
 c) Class C  
 d) Class D
- 6) Error detection at the data link level is achieved by \_\_\_\_\_.  
 a) Bit stuffing  
 b) CRC  
 c) Hamming code  
 d) Equalization
- 7) In \_\_\_\_\_ ARQ, if a NAK is received, only the specific damaged or lost frame is retransmitted.  
 a) Stop-and-wait  
 b) Go Back N  
 c) Selective repeat  
 d) Stop-and-wait and Go back N
- 8) Which one of the following extends a private network across public networks?  
 a) local area network  
 b) virtual private network  
 c) enterprise private network  
 d) storage area network
- 9) DHCP (dynamic host configuration protocol) provides \_\_\_\_\_ to the client.  
 a) IP address  
 b) MAC address  
 c) Url  
 d) None of above

- 10) Physical or logical arrangement of network is \_\_\_\_\_
- a) Topology
  - b) Routing
  - c) Networking
  - d) None of the mentioned
- 11) This of the following is not applicable for IP \_\_\_\_\_.
- a) Error reporting
  - b) Handle addressing conventions
  - c) Datagram format
  - d) Packet handling conventions
- 12) The data field can carry which of the following \_\_\_\_\_..
- a) TCP segment
  - b) UDP segment
  - c) ICMP messages
  - d) None of the mentioned
- 13) Which of the following is false with respect to UDP?
- a) Connection oriented
  - b) Unreliable
  - c) Transport layer protocol
  - d) All of the mentioned
- 14) Transparent, spanning tree and hybrid are the examples of \_\_\_\_\_.
- a) Routers
  - b) Bridges
  - c) Gateways
  - d) Switches



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**B.E. (Part -I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02.30 PM To 05.30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section - I**

- Q.2 Attempt any four:** **16**
- a) What is CRC method for error detection? Find CRC code for data word 1101011011 and divisor 10011.
  - b) What are various frame making methods?
  - c) Discuss the terms, Modems, switches, hubs, bridges?
  - d) Discuss the stop and wait protocol in detail?
  - e) Give the comparison between different LAN's?
- Q.3 Attempt any two:** **12**
- a) Discuss the working principle of sliding window protocol mechanism in detail?
  - b) Illustrate with a neat diagram working of CSMA/CD in detail?
  - c) Give the difference between circuit switching and packet switching techniques?

**Section - II**

- Q.4 Attempt any four:** **16**
- a) Illustrate with a neat diagram working of TCP/IP in detail.
  - b) Give comparison between virtual circuit & datagram approach.
  - c) Discuss the term Internet protocol ver. 4 (IPv4) in detail with its different types of notations.
  - d) Give the difference between TCP/IP and UDP/IP.
  - e) With a neat diagram discuss UDP header.
- Q.5 Attempt any two:** **12**
- a) Explain three way handshakes in TCP. What is the use of VER, HELN and TTL fields in case of IP?
  - b) Discuss TCP/IP header format, also describe how each field is used during communication?
  - c) Discuss the routing protocol with reference to shortest path algorithm.

Seat No.	
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Set	Q
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**B.E. (Part -I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02.30 PM To 05.30 PM

Max. Marks: 70

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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 and rewrite the sentence. 14**

- 1) Which one of the following extends a private network across public networks?
 

a) local area network	b) virtual private network
c) enterprise private network	d) storage area network
- 2) DHCP (dynamic host configuration protocol) provides \_\_\_\_\_ to the client.
 

a) IP address	b) MAC address
c) Url	d) None of above
- 3) Physical or logical arrangement of network is \_\_\_\_\_.
 

a) Topology	b) Routing
c) Networking	d) None of the mentioned
- 4) This of the following is not applicable for IP \_\_\_\_\_.
 

a) Error reporting
b) Handle addressing conventions
c) Datagram format
d) Packet handling conventions
- 5) The data field can carry which of the following \_\_\_\_\_.
 

a) TCP segment
b) UDP segment
c) ICMP messages
d) None of the mentioned
- 6) Which of the following is false with respect to UDP?
 

a) Connection oriented	b) Unreliable
c) Transport layer protocol	d) All of the mentioned
- 7) Transparent, spanning tree and hybrid are the examples of \_\_\_\_\_.
 

a) Routers	b) Bridges
c) Gateways	d) Switches
- 8) Flow control is needed to prevent \_\_\_\_\_.
 

a) Bit error
b) Overflow of sender's buffer
c) Collision between sender and receiver
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- 9) This CSMA shows the best performance \_\_\_\_\_.
- a) 1-persistent
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- 10) NIC (Network Interface Card) is \_\_\_\_\_ layer device.
- a) Physical
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- 11) The data unit in transport layer in TCP/IP is called \_\_\_\_\_.
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- 12) Which IP Class has few hosts per network?
- a) Class A
  - b) Class B
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- 13) Error detection at the data link level is achieved by \_\_\_\_\_.
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  - d) Equalization
- 14) In \_\_\_\_\_ ARQ, if a NAK is received, only the specific damaged or lost frame is retransmitted.
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Set	Q
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- Q.3 Attempt any two:** **12**
- a) Discuss the working principle of sliding window protocol mechanism in detail?
  - b) Illustrate with a neat diagram working of CSMA/CD in detail?
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**Section - II**

- Q.4 Attempt any four:** **16**
- a) Illustrate with a neat diagram working of TCP/IP in detail.
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  - c) Discuss the term Internet protocol ver. 4 (IPv4) in detail with its different types of notations.
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- Q.5 Attempt any two:** **12**
- a) Explain three way handshakes in TCP. What is the use of VER, HELN and TTL fields in case of IP?
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Duration: 30 Minutes

Marks: 14

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**COMPUTER NETWORKS**

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  - a) Error reporting
  - b) Handle addressing conventions
  - c) Datagram format
  - d) Packet handling conventions
- 3) The data field can carry which of the following \_\_\_\_\_.
  - a) TCP segment
  - b) UDP segment
  - c) ICMP messages
  - d) None of the mentioned
- 4) Which of the following is false with respect to UDP?
  - a) Connection oriented
  - b) Unreliable
  - c) Transport layer protocol
  - d) All of the mentioned
- 5) Transparent, spanning tree and hybrid are the examples of \_\_\_\_\_.
  - a) Routers
  - b) Bridges
  - c) Gateways
  - d) Switches
- 6) Flow control is needed to prevent \_\_\_\_\_.
  - a) Bit error
  - b) Overflow of sender's buffer
  - c) Collision between sender and receiver
  - d) Overflow of receiver's buffer
- 7) This CSMA shows the best performance \_\_\_\_\_.
  - a) I-persistent
  - b) non-persistent
  - c) p-persistent
  - d) All mentioned
- 8) NIC (Network Interface Card) is \_\_\_\_\_ layer device.
  - a) Physical
  - b) Data Link
  - c) Network
  - d) Application





Seat No.	
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Set	S
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**B.E. (Part -I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02.30 PM To 05.30 PM

Max. Marks: 56

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

**Section - I**

- Q.2 Attempt any four:** **16**
- a) What is CRC method for error detection? Find CRC code for data word 1101011011 and divisor 10011.
  - b) What are various frame making methods?
  - c) Discuss the terms, Modems, switches, hubs, bridges?
  - d) Discuss the stop and wait protocol in detail?
  - e) Give the comparison between different LAN's?
- Q.3 Attempt any two:** **12**
- a) Discuss the working principle of sliding window protocol mechanism in detail?
  - b) Illustrate with a neat diagram working of CSMA/CD in detail?
  - c) Give the difference between circuit switching and packet switching techniques?

**Section - II**

- Q.4 Attempt any four:** **16**
- a) Illustrate with a neat diagram working of TCP/IP in detail.
  - b) Give comparison between virtual circuit & datagram approach.
  - c) Discuss the term Internet protocol ver. 4 (IPv4) in detail with its different types of notations.
  - d) Give the difference between TCP/IP and UDP/IP.
  - e) With a neat diagram discuss UDP header.
- Q.5 Attempt any two:** **12**
- a) Explain three way handshakes in TCP. What is the use of VER, HELN and TTL fields in case of IP?
  - b) Discuss TCP/IP header format, also describe how each field is used during communication?
  - c) Discuss the routing protocol with reference to shortest path algorithm.

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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Small scale fading describes the \_\_\_\_\_ fluctuations of the amplitude, phases of signal.
 

a) Rapid	b) Slow
c) Instantaneous	d) Different
- 2) \_\_\_\_\_ range covers maximum geographical range of all.
 

a) Transmission	b) Detection
c) Interference	d) Handover
- 3) Training Sequence and Equalization are solutions for \_\_\_\_\_ interference.
 

a) inter symbol	b) co channel
c) adjacent channel	d) Noise
- 4) Why neighbouring stations are assigned different group of channels in cellular system?
 

a) To minimize interference
b) To minimize area
c) To maximize throughput
d) To maximize capacity of each cell
- 5) What is a cell in cellular system?
 

a) A small geographical area
b) A group of subscribers
c) A group of cells
d) A large group of mobile systems
- 6) For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
 

a) $S=k*N$	b) $S=k/N$
c) $S=N/k$	d) $S=k^N$
- 7) \_\_\_\_\_ are used to resolve and combine multipath components.
 

a) Equalizer	b) Registers
c) RAKE receiver	d) Frequency divider

- 8) Which of below is true for a Walsh Code?
- a) They are orthogonal
  - b) They are used in CDMA
  - c) Their Inner Product with self is maximum
  - d) All of above
- 9) In IEEE 802.11 DSSS spreading is achieved using \_\_\_\_\_.
- a) Walsh Code
  - b) Training sequence
  - c) Barker Sequence
  - d) None of above
- 10) Agent discovery & solicitation terms are associated with \_\_\_\_\_ layer.
- a) mobile network
  - b) mobile IP
  - c) transport
  - d) all of above
- 11) In a IEEE 802.11 MAC packet structure, first two bytes are \_\_\_\_\_.
- a) frame control
  - b) duration ID
  - c) preamble
  - d) sequence number
- 12) A Bluetooth network is called \_\_\_\_\_.
- a) Wireless Network
  - b) WAN
  - c) Piconet
  - d) LAN
- 13) A wireless network interface controller can work in \_\_\_\_\_.
- a) infrastructure mode
  - b) ad-hoc mode
  - c) both infrastructure mode and ad-hoc mode
  - d) none of the mentioned
- 14) What is the access point (AP) in wireless LAN?
- a) Device that allows wireless devices to connect to wired network
  - b) wireless devices itself
  - c) both device that allows wireless devices to connect to a wired network and wireless devices itself
  - d) none of the mentioned

Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four.** **16**
- a) How signal spreading is achieved using FHSS?
  - b) Compare Wireless and fixed network.
  - c) CSMA/CD MAC is used in wired network but it fails in wireless network. Justify the statement.
  - d) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577  $\mu$ S.
  - e) How the mobile originated call in GSM?
- Q.3 Attempt any two.** **12**
- a) Channel interference is one of the limitations of cellular system. Specify what are their types, sources and techniques to resolve them?
  - b) Justify how cell sectoring can increase user capacity?
  - c) Base Station uses the reverse link channels in IS95, describe those channels in brief.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) What are the requirements for a Mobile IP?
  - b) With suitable example explain master, slave, parked & standby modes.
  - c) Define mobile computing. Describe mobile computing function.
  - d) Describe ad-hoc architecture for WLAN.
  - e) What is agent solicitation? Why is it required?
- Q.5 Attempt any two.** **12**
- a) Specify the radio transmission with DSSS PHY frame structure for IEEE 802.11.
  - b) Explain with example - Data transfer on SCO and ACL links for Bluetooth.
  - c) With suitable diagram explain how a packet is sent from a fixed node to a mobile node which is presently in a foreign network?

Seat No.	
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Set **Q**

**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 below is true for a Walsh Code?
  - a) They are orthogonal
  - b) They are used in CDMA
  - c) Their Inner Product with self is maximum
  - d) All of above
- 2) In IEEE 802.11 DSSS spreading is achieved using \_\_\_\_\_.
  - a) Walsh Code
  - b) Training sequence
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  - d) None of above
- 3) Agent discovery & solicitation terms are associated with \_\_\_\_\_ layer.
  - a) mobile network
  - b) mobile IP
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  - b) ad-hoc mode
  - c) both infrastructure mode and ad-hoc mode
  - d) none of the mentioned
- 7) What is the access point (AP) in wireless LAN?
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  - b) wireless devices itself
  - c) both device that allows wireless devices to connect to a wired network and wireless devices itself
  - d) none of the mentioned
- 8) Small scale fading describes the \_\_\_\_\_ fluctuations of the amplitude, phases of signal.
  - a) Rapid
  - b) Slow
  - c) Instantaneous
  - d) Different



Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- a) How signal spreading is achieved using FHSS?
  - b) Compare Wireless and fixed network.
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  - d) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577  $\mu$ S.
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  - b) Justify how cell sectoring can increase user capacity?
  - c) Base Station uses the reverse link channels in IS95, describe those channels in brief.

**Section – II**

- Q.4 Attempt any four. 16**
- a) What are the requirements for a Mobile IP?
  - b) With suitable example explain master, slave, parked & standby modes.
  - c) Define mobile computing. Describe mobile computing function.
  - d) Describe ad-hoc architecture for WLAN.
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  - c) With suitable diagram explain how a packet is sent from a fixed node to a mobile node which is presently in a foreign network?



Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 a cell in cellular system?
  - a) A small geographical area
  - b) A group of subscribers
  - c) A group of cells
  - d) A large group of mobile systems
- 2) For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
  - a)  $S=k*N$
  - b)  $S=k/N$
  - c)  $S=N/k$
  - d)  $S=k^N$
- 3) \_\_\_\_\_ are used to resolve and combine multipath components.
  - a) Equalizer
  - b) Registers
  - c) RAKE receiver
  - d) Frequency divider
- 4) Which of below is true for a Walsh Code?
  - a) They are orthogonal
  - b) They are used in CDMA
  - c) Their Inner Product with self is maximum
  - d) All of above
- 5) In IEEE 802.11 DSSS spreading is achieved using \_\_\_\_\_.
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  - b) Training sequence
  - c) Barker Sequence
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  - b) mobile IP
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  - b) duration ID
  - c) preamble
  - d) sequence number
- 8) A Bluetooth network is called \_\_\_\_\_.
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  - b) WAN
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  - d) LAN

- 9) A wireless network interface controller can work in \_\_\_\_\_.  
a) infrastructure mode  
b) ad-hoc mode  
c) both infrastructure mode and ad-hoc mode  
d) none of the mentioned
- 10) What is the access point (AP) in wireless LAN?  
a) Device that allows wireless devices to connect to wired network  
b) wireless devices itself  
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a) Rapid  
b) Slow  
c) Instantaneous  
d) Different
- 12) \_\_\_\_\_ range covers maximum geographical range of all.  
a) Transmission  
b) Detection  
c) Interference  
d) Handover
- 13) Training Sequence and Equalization are solutions for \_\_\_\_\_ interference.  
a) inter symbol  
b) co channel  
c) adjacent channel  
d) Noise
- 14) Why neighbouring stations are assigned different group of channels in cellular system?  
a) To minimize interference  
b) To minimize area  
c) To maximize throughput  
d) To maximize capacity of each cell

Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- a) How signal spreading is achieved using FHSS?
  - b) Compare Wireless and fixed network.
  - c) CSMA/CD MAC is used in wired network but it fails in wireless network. Justify the statement.
  - d) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577  $\mu$ S.
  - e) How the mobile originated call in GSM?
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- a) Channel interference is one of the limitations of cellular system. Specify what are their types, sources and techniques to resolve them?
  - b) Justify how cell sectoring can increase user capacity?
  - c) Base Station uses the reverse link channels in IS95, describe those channels in brief.

**Section – II**

- Q.4 Attempt any four. 16**
- a) What are the requirements for a Mobile IP?
  - b) With suitable example explain master, slave, parked & standby modes.
  - c) Define mobile computing. Describe mobile computing function.
  - d) Describe ad-hoc architecture for WLAN.
  - e) What is agent solicitation? Why is it required?
- Q.5 Attempt any two. 12**
- a) Specify the radio transmission with DSSS PHY frame structure for IEEE 802.11.
  - b) Explain with example - Data transfer on SCO and ACL links for Bluetooth.
  - c) With suitable diagram explain how a packet is sent from a fixed node to a mobile node which is presently in a foreign network?

Seat No.	
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Set	S
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Agent discovery & solicitation terms are associated with \_\_\_\_\_ layer.
  - a) mobile network
  - b) mobile IP
  - c) transport
  - d) all of above
- 2) In a IEEE 802.11 MAC packet structure, first two bytes are \_\_\_\_\_.
  - a) frame control
  - b) duration ID
  - c) preamble
  - d) sequence number
- 3) A Bluetooth network is called \_\_\_\_\_.
  - a) Wireless Network
  - b) WAN
  - c) Piconet
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- 4) A wireless network interface controller can work in \_\_\_\_\_.
  - a) infrastructure mode
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- 6) Small scale fading describes the \_\_\_\_\_ fluctuations of the amplitude, phases of signal.
  - a) Rapid
  - b) Slow
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- 7) \_\_\_\_\_ range covers maximum geographical range of all.
  - a) Transmission
  - b) Detection
  - c) Interference
  - d) Handover
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- To minimize interference
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- $S=k*N$
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  - $S=N/k$
  - $S=k^N$
- 12) \_\_\_\_\_ are used to resolve and combine multipath components.
- Equalizer
  - Registers
  - RAKE receiver
  - Frequency divider
- 13) Which of below is true for a Walsh Code?
- They are orthogonal
  - They are used in CDMA
  - Their Inner Product with self is maximum
  - All of above
- 14) In IEEE 802.11 DSSS spreading is achieved using \_\_\_\_\_.
- Walsh Code
  - Training sequence
  - Barker Sequence
  - None of above

Seat No.	
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Set **S**

**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronic Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four.** **16**
- a) How signal spreading is achieved using FHSS?
  - b) Compare Wireless and fixed network.
  - c) CSMA/CD MAC is used in wired network but it fails in wireless network. Justify the statement.
  - d) With suitable diagram explain GSM time frame of 4.615 ms and a time slot of 577  $\mu$ S.
  - e) How the mobile originated call in GSM?
- Q.3 Attempt any two.** **12**
- a) Channel interference is one of the limitations of cellular system. Specify what are their types, sources and techniques to resolve them?
  - b) Justify how cell sectoring can increase user capacity?
  - c) Base Station uses the reverse link channels in IS95, describe those channels in brief.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) What are the requirements for a Mobile IP?
  - b) With suitable example explain master, slave, parked & standby modes.
  - c) Define mobile computing. Describe mobile computing function.
  - d) Describe ad-hoc architecture for WLAN.
  - e) What is agent solicitation? Why is it required?
- Q.5 Attempt any two.** **12**
- a) Specify the radio transmission with DSSS PHY frame structure for IEEE 802.11.
  - b) Explain with example - Data transfer on SCO and ACL links for Bluetooth.
  - c) With suitable diagram explain how a packet is sent from a fixed node to a mobile node which is presently in a foreign network?

Seat No.	
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**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.  
 2) Each question carries one mark.  
 3) 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) The \_\_\_\_\_ Timer is a basic countdown timer that can be used to generate interrupts at regular time intervals, even when the system is in sleep mode.
  - a) SYSTICK
  - b) Watchdog
  - c) Repetitive Interrupt Timer
  - d) None of these
- 2) The \_\_\_\_\_ registers are useful for temporarily disabling interrupts in timing-critical tasks.
  - a) PRIMASK
  - b) BASEPRI
  - c) Both a and b
  - d) None of the above
- 3) To force logic '0' on port pin P0.30, \_\_\_\_\_ register is used in LPC1768.
  - a) FIO1CLR
  - b) FIO2CLR
  - c) FIO0CLR
  - d) FIO3CLR
- 4) LPC1768 has on-chip \_\_\_\_\_ KB flash memory and \_\_\_\_\_ KB SRAM.
  - a) 30, 16
  - b) 128, 32
  - c) 256, 40
  - d) 512, 64
- 5) After the execution of following ARM instruction the content of R0 register will be \_\_\_\_\_.  
 ADD R0, R1, R1, LSL #3
  - a)  $R1 + (R1 * 8)$
  - b)  $R1 + (R1 * 7)$
  - c)  $R1 + (R1 / 8)$
  - d)  $R1 + (R1 / 7)$
- 6) Highest priority exception in ARM Cortex-M3 processor is \_\_\_\_\_.
  - a) Reset
  - b) Hard fault
  - c) Bus fault
  - d) NMI
- 7) What is the value of R1 after MVN R1, #1 is executed?
  - a) 0x00000001
  - b) 0xFFFFFFFF
  - c) 0xFFFFF000
  - d) 0xFFFFF001
- 8) RFID is an acronym for \_\_\_\_\_.
  - a) Radio frequency Identification
  - b) Random frequency Identification
  - c) Radio frequency Identify
  - d) Random frequency Identity

- 9) With respect to the IEEE 802.15.4 standard which statement is true?
- a) It is a low data-rate standard
  - b) Used for architecting wireless PANs
  - c) Uses only two layers - PHY and MAC
  - d) All for these
- 10) In MQTT the central communication point is \_\_\_\_\_.
- a) MQTT broker
  - b) MQTT publisher
  - c) MQTT subscriber
  - d) None of the above
- 11) Infrastructure-Cloud deals with \_\_\_\_\_.
- a) Infrastructure-as-a-Service
  - b) Infrastructure-in Cloud
  - c) Infrastructure-for-Service
  - d) None of these
- 12) \_\_\_\_\_ supports a long-range communication.
- a) ZigBee
  - b) GPRS
  - c) Bluetooth
  - d) All of the above
- 13) Class-1 Bluetooth devices have a range of \_\_\_\_\_.
- a) 1m
  - b) 10m
  - c) 100m
  - d) 1000m
- 14) Wireless access points uses \_\_\_\_\_.
- a) IEEE 802.15.4 protocol
  - b) IEEE 802.15.6 protocol
  - c) IEEE 802.11 protocol
  - d) None of the above



Seat No.	
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**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any Four. 16**
- a) Discuss the features of built-in nested vectored interrupt controller of Cortex-M3 processor.
  - b) What are the architectural layers in a modified OSI model for IoT systems?
  - c) Write short notes on ARM Cortex M3 memory map.
  - d) List down and discuss the flags available in ARM Processors.
  - e) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- Q.3 Attempt any Two. 12**
- a) Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
  - b) Discuss LDR and STR data moving instructions in details with examples.
  - c) Interface a stepper motor to LPC1768 port pins P0.10-P0.13. Write an embedded c program to rotate motor anti-clockwise.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Write short note on IEEE 802.11 modulation and encoding techniques.
  - b) What is a Bluetooth profile? Discuss a Bluetooth profile in detail.
  - c) List down and discuss levels of quality of service in MQTT.
  - d) What is a Cloud? Discuss SaaS services supported in Cloud.
  - e) Write short note on RFID tags and RFID controllers.
- Q.5 Attempt any two. 12**
- a) With a neat diagram discuss the core components of an RFID system.
  - b) With an example discuss the CoAP NON and CON messaging in detail.
  - c) Discuss with neat diagram the MQTT publish-subscribe model and topology.

Seat No.	
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**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.  
 2) Each question carries one mark.  
 3) 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) RFID is an acronym for \_\_\_\_\_.
  - a) Radio frequency Identification
  - b) Random frequency Identification
  - c) Radio frequency Identify
  - d) Random frequency Identity
- 2) With respect to the IEEE 802.15.4 standard which statement is true?
  - a) It is a low data-rate standard
  - b) Used for architecting wireless PANs
  - c) Uses only two layers - PHY and MAC
  - d) All for these
- 3) In MQTT the central communication point is \_\_\_\_\_.
  - a) MQTT broker
  - b) MQTT publisher
  - c) MQTT subscriber
  - d) None of the above
- 4) Infrastructure-Cloud deals with \_\_\_\_\_.
  - a) Infrastructure-as-a-Service
  - b) Infrastructure-in Cloud
  - c) Infrastructure-for-Service
  - d) None of these
- 5) \_\_\_\_\_ supports a long-range communication.
  - a) ZigBee
  - b) GPRS
  - c) Bluetooth
  - d) All of the above
- 6) Class-1 Bluetooth devices have a range of \_\_\_\_\_.
  - a) 1m
  - b) 10m
  - c) 100m
  - d) 1000m
- 7) Wireless access points uses \_\_\_\_\_.
  - a) IEEE 802.15.4 protocol
  - b) IEEE 802.15.6 protocol
  - c) IEEE 802.11 protocol
  - d) None of the above
- 8) The \_\_\_\_\_ Timer is a basic countdown timer that can be used to generate interrupts at regular time intervals, even when the system is in sleep mode.
  - a) SYSTICK
  - b) Watchdog
  - c) Repetitive Interrupt Timer
  - d) None of these

- 9) The \_\_\_\_\_ registers are useful for temporarily disabling interrupts in timing-critical tasks.
- |                 |                      |
|-----------------|----------------------|
| a) PRIMASK      | b) BASEPRI           |
| c) Both a and b | d) None of the above |
- 10) To force logic '0' on port pin P0.30, \_\_\_\_\_ register is used in LPC1768.
- |            |            |
|------------|------------|
| a) FIO1CLR | b) FIO2CLR |
| c) FIO0CLR | d) FIO3CLR |
- 11) LPC1768 has on-chip \_\_\_\_\_ KB flash memory and \_\_\_\_\_ KB SRAM.
- |            |            |
|------------|------------|
| a) 30,16   | b) 128, 32 |
| c) 256, 40 | d) 512, 64 |
- 12) After the execution of following ARM instruction the content of R0 register will be \_\_\_\_\_.
- ADD R0, R1, R1, LSL #3
- |                    |                    |
|--------------------|--------------------|
| a) $R1 + (R1 * 8)$ | b) $R1 + (R1 * 7)$ |
| c) $R1 + (R1 / 8)$ | d) $R1 + (R1 / 7)$ |
- 13) Highest priority exception in ARM Cortex-M3 processor is \_\_\_\_\_.
- |              |               |
|--------------|---------------|
| a) Reset     | b) Hard fault |
| c) Bus fault | d) NMI        |
- 14) What is the value of R1 after MVN R1, #1 is executed?
- |               |               |
|---------------|---------------|
| a) 0x00000001 | b) 0xFFFFFFFF |
| c) 0xFFFFF000 | d) 0xFFFFF001 |

Seat No.	
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**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

- Q.2 Attempt any Four.** **16**
- a) Discuss the features of built-in nested vectored interrupt controller of Cortex-M3 processor.
  - b) What are the architectural layers in a modified OSI model for IoT systems?
  - c) Write short notes on ARM Cortex M3 memory map.
  - d) List down and discuss the flags available in ARM Processors.
  - e) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- Q.3 Attempt any Two.** **12**
- a) Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
  - b) Discuss LDR and STR data moving instructions in details with examples.
  - c) Interface a stepper motor to LPC1768 port pins P0.10-P0.13. Write an embedded c program to rotate motor anti-clockwise.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) Write short note on IEEE 802.11 modulation and encoding techniques.
  - b) What is a Bluetooth profile? Discuss a Bluetooth profile in detail.
  - c) List down and discuss levels of quality of service in MQTT.
  - d) What is a Cloud? Discuss SaaS services supported in Cloud.
  - e) Write short note on RFID tags and RFID controllers.
- Q.5 Attempt any two.** **12**
- a) With a neat diagram discuss the core components of an RFID system.
  - b) With an example discuss the CoAP NON and CON messaging in detail.
  - c) Discuss with neat diagram the MQTT publish-subscribe model and topology.





Seat No.	
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**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

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Seat  
No.**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**Day & Date: Saturday,14-12-2019  
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Max. Marks: 70

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 9) LPC1768 has on-chip \_\_\_\_\_ KB flash memory and \_\_\_\_\_ KB SRAM.
  - a) 30,16
  - b) 128, 32
  - c) 256, 40
  - d) 512, 64





Seat No.	
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**B.E. (Part - I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

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  - d) List down and discuss the flags available in ARM Processors.
  - e) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
- Q.3 Attempt any Two. 12**
- a) Give example of IoT's used in a smart home with sensors, actuators and smart home automation software.
  - b) Discuss LDR and STR data moving instructions in details with examples.
  - c) Interface a stepper motor to LPC1768 port pins P0.10-P0.13. Write an embedded c program to rotate motor anti-clockwise.

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- Q.4 Attempt any four. 16**
- a) Write short note on IEEE 802.11 modulation and encoding techniques.
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Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONIC**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Assume suitable data wherever.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) When \_\_\_\_\_ contacts are actuated, they interrupt the power supply through them.
  - a) Normally open type
  - b) Normally closed type
  - c) Both a. and b
  - d) None of the above
- 2) \_\_\_\_\_ is doping process whereby dopant ions are introduced into the material of interest to change its property.
  - a) Etching
  - b) Ion Implantation
  - c) Diffusion
  - d) Evaporation
- 3) A \_\_\_\_\_ is a solid cylinder or disk that fits snugly into a larger cylinder and moves under fluid pressure.
  - a) Screw
  - b) Compressor
  - c) Piston
  - d) Rod
- 4) MEMS stand for \_\_\_\_\_.
  - a) Micro Electromechanical system
  - b) Mini Electromechanical system
  - c) Micro Electrical Mechanical system
  - d) Mini Electrical Mechanical system
- 5) \_\_\_\_\_ is process, in which impure material is added to a material of interest.
  - a) Etching
  - b) Implantation
  - c) Doping
  - d) Evaporation
- 6) Actuators are interfaced with \_\_\_\_\_ card of the PLC.
  - a) Memory
  - b) Input
  - c) Output
  - d) Power
- 7) In a temperature control system, what represents the output of the system \_\_\_\_\_.
  - a) The required temperature
  - b) The actual temperature achieved
  - c) The heat produced by the system
  - d) The heating element
- 8) With integral control, the controller output is, \_\_\_\_\_.
  - i) Zero when the error changes at a constant rate.
  - ii) Increases at a constant rate when the error is constant
  - a) Both i and ii are true
  - b) i is true and ii is false
  - c) i is false and ii is true
  - d) Both i and ii are false



<b>Seat No.</b>	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONIC**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

- Q.2 Solve any four** **16**
- a) What is the process stages involved in mechatronics system design?
  - b) What are the key elements of Mechatronics system?
  - c) How displacement can be measured using LVDT?
  - d) Explain the principle of operation of optical encoders.
  - e) Draw and explain pneumatic power supply.
- Q.3 Solve any Two** **12**
- a) With suitable example explain Microprocessor based controllers in mechatronics.
  - b) Write a short note on
    - 1) Light sensor
    - 2) proximity switches
  - c) How linear cylinder can be used to produce rotation?

**Section – II**

- Q.4 Solve any four** **16**
- a) How Gear trains are used to transfer and transform rotational motion.
  - b) Draw and explain the mechanisms of Ratchet and Pawl.
  - c) Explain LIGA tooling and replication method.
  - d) Explain working of different micro thermal sensors.
  - e) List down the differences between traditional design approach and mechatronics.
- Q.5 Solve any two** **12**
- a) Illustrate the working of CAMs of different shapes.
  - b) What is wet and dry etching in bulk micromachining?
  - c) Design a mechatronics system for an automatic Car Park Systems?

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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
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  - d) Both i and ii are false
- 2) The resolution of an analogue to digital converter with a word length of 10 bits and an analogue signal input range of 10V is \_\_\_\_\_.
  - a) 9.76 mV
  - b) 256 mV
  - c) 1.25 mV
  - d) 5V
- 3) The basic element of ON/OFF controller is \_\_\_\_\_.
  - a) Amplifier
  - b) Comparator
  - c) Oscillator
  - d) Differential amplifier
- 4) \_\_\_\_\_ is process, which makes it possible to selectively remove the deposited films or parts of the substrate in order to obtain desired patterns.
  - a) Etching
  - b) Implantation
  - c) Doping
  - d) Evaporation
- 5) In \_\_\_\_\_ strain gages, change resistance in response to a mechanical strain.
  - a) Piezo-electric
  - b) RTD
  - c) Piezo-resistive
  - d) None of the above
- 6) For precise measurement, strain gauge must have the following properties \_\_\_\_\_.
  - a) High gauge factor
  - b) Low temperature coefficient
  - c) High resistance
  - d) All of the above
- 7) A \_\_\_\_\_ actuator uses a pressurized air to drive a piston.
  - a) Hydraulic
  - b) Pneumatic
  - c) None of the above
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- 8) When \_\_\_\_\_ contacts are actuated, they interrupt the power supply through them.
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- 10) A \_\_\_\_\_ is a solid cylinder or disk that fits snugly into a larger cylinder and moves under fluid pressure.
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- 11) MEMS stand for \_\_\_\_\_.
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<b>Seat No.</b>	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONIC**

Day & Date: Tuesday, 17-12-2019  
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**Section – I**

- Q.2 Solve any four** **16**
- a) What is the process stages involved in mechatronics system design?
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  - d) Explain the principle of operation of optical encoders.
  - e) Draw and explain pneumatic power supply.
- Q.3 Solve any Two** **12**
- a) With suitable example explain Microprocessor based controllers in mechatronics.
  - b) Write a short note on
    - 1) Light sensor
    - 2) proximity switches
  - c) How linear cylinder can be used to produce rotation?

**Section – II**

- Q.4 Solve any four** **16**
- a) How Gear trains are used to transfer and transform rotational motion.
  - b) Draw and explain the mechanisms of Ratchet and Pawl.
  - c) Explain LIGA tooling and replication method.
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  - e) List down the differences between traditional design approach and mechatronics.
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Seat  
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
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  - b) Write a short note on
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    - 2) proximity switches
  - c) How linear cylinder can be used to produce rotation?

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- Q.4 Solve any four** **16**
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- a) Illustrate the working of CAMs of different shapes.
  - b) What is wet and dry etching in bulk micromachining?
  - c) Design a mechatronics system for an automatic Car Park Systems?



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<b>Seat No.</b>	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONIC**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I**

- Q.2 Solve any four** **16**
- a) What is the process stages involved in mechatronics system design?
  - b) What are the key elements of Mechatronics system?
  - c) How displacement can be measured using LVDT?
  - d) Explain the principle of operation of optical encoders.
  - e) Draw and explain pneumatic power supply.
- Q.3 Solve any Two** **12**
- a) With suitable example explain Microprocessor based controllers in mechatronics.
  - b) Write a short note on
    - 1) Light sensor
    - 2) proximity switches
  - c) How linear cylinder can be used to produce rotation?

**Section – II**

- Q.4 Solve any four** **16**
- a) How Gear trains are used to transfer and transform rotational motion.
  - b) Draw and explain the mechanisms of Ratchet and Pawl.
  - c) Explain LIGA tooling and replication method.
  - d) Explain working of different micro thermal sensors.
  - e) List down the differences between traditional design approach and mechatronics.
- Q.5 Solve any two** **12**
- a) Illustrate the working of CAMs of different shapes.
  - b) What is wet and dry etching in bulk micromachining?
  - c) Design a mechatronics system for an automatic Car Park Systems?

Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 statement is wrong about PRIMARY KEY constraint in SQL?
  - a) The PRIMARY KEY uniquely identifies each record in a SQL database table
  - b) Primary key can be made based on multiple columns
  - c) Primary key must be made of any single columns
  - d) Primary keys must contain UNIQUE values.
- 2) SQL Query to delete all rows in a table without deleting the table (structure, attributes, and indexes)
  - a) DELETE FROM table\_name;
  - b) DELETE TABLE table\_name;
  - c) DROP TABLE table\_name;
  - d) NONE
- 3) Wrong statement about ORDER BY keyword is \_\_\_\_\_.
  - a) Used to sort the result-set in ascending or descending order
  - b) The ORDER BY keyword sorts the records in ascending order by default
  - c) To sort the records in ascending order, use the ASC keyword
  - d) To sort the records in descending order, use the DECENDING keyword
- 4) What type of join is needed when you wish to include rows that do not have matching values?
  - a) Equi-join
  - b) Natural join
  - c) Outer join
  - d) All of the Mentioned
- 5) The description of a database is called \_\_\_\_\_.
  - a) Snap shot
  - b) Schema
  - c) Valid state
  - d) None
- 6) The data in the database at a particular moment in time is \_\_\_\_\_.
  - a) Schema
  - b) Instances
  - c) Both a) and b)
  - d) None of these
- 7) \_\_\_\_\_ is responsible for authorizing access to the database.
  - a) DB designers
  - b) End users
  - c) DBA
  - d) None of these

- 8) What is purpose of index in sql server?  
a) To enhance the query performance  
b) To provide an index to a record  
c) To perform fast searches  
d) All of the mentioned
- 9) Which one is not consist in structure of SQL expression \_\_\_\_\_.  
a) Select  
b) Where  
c) From  
d) When
- 10) Which of the following is not a type of SQL statement?  
a) Data Manipulation Language (DML)  
b) Data Definition Language (DDL)  
c) Data Control Language (DCL)  
d) Data Communication Language (DCL)
- 11) The total participation of an entity in a relationship set indicated by \_\_\_\_\_.  
a) Lines  
b) Dashed line  
c) Diamonds  
d) Double lines
- 12) \_\_\_\_\_ 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
- 13) A level that describes data stored in a database and the relationships among the data.  
a) physical  
b) logical  
c) user  
d) view
- 14) Which of the following is a NoSQL Database Type?  
a) SQL  
b) Document databases  
c) JSON  
d) All of the mentioned



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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Define the following terms:
  - 1) Data Abstraction
  - 2) Weak Entity
- b) Differentiate between logical data independence and physical data independence? Which one is harder to achieve and Why?
- c) What are database utilities? List a few common functions that the utilities perform.
- d) Explain with diagram 1 :N and M : N relationship types with example.
- e) Differentiate between.
  - 1) Composite and simple Attributes.
  - 2) Stored and Derived Attributes.
- f) Describe the three-schema architecture.

**Q.3 Solve any Two** **12**

- a) Draw and Explain Notations for ER diagram.
- b) Explain the Centralized architecture for DBMS.
- c) Draw an ER Diagram for following schema? State the assumption about cardinality and other constraints in the answer.

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takes (ID, course\_id, sec\_id, semester, year, grade)

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advisor(s\_ID, i\_ID)

sec\_course(course\_id, sec\_id, semester, year, timer\_slot\_id)

sec\_class(course\_id, sec\_id, semester, year, building, room\_number)

inst\_dept(ID, dept\_name)

stud\_dept(ID, dept\_name)

course\_dept(course\_id, dept\_name)

**Section – II**

- Q.4 Solve any four** **16**
- a) Explain with example Insert and Update commands.
  - b) Explain the following join with example in SQL.
    - 1) Inner Join.
    - 2) Full Outer Join.
  - c) How do you define big data? And Explain the three V's of characterized big data.
  - d) How can hashing be used to construct an index?
  - e) Explain secondary index with an example.
  - f) Write SQL statements to do the following on the database schema Instructor (ID, name, dept\_name, salary).
    - 1) Increase salaries of instructors whose salary by a 10%.
    - 2) Retrieve the dept\_name and address of all employees who work for the 'Research'.
- Q.5 Solve any two** **12**
- a) Describe the architecture of Hadoop?
  - b) Explain in brief B+ tree Index.
  - c) Explain aggregation with example.

Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) What is purpose of index in sql server?
  - a) To enhance the query performance
  - b) To provide an index to a record
  - c) To perform fast searches
  - d) All of the mentioned
- 2) Which one is not consist in structure of SQL expression \_\_\_\_\_.
  - a) Select
  - b) Where
  - c) From
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- 3) Which of the following is not a type of SQL statement?
  - a) Data Manipulation Language (DML)
  - b) Data Definition Language (DDL)
  - c) Data Control Language (DCL)
  - d) Data Communication Language (DCL)
- 4) The total participation of an entity in a relationship set indicated by \_\_\_\_\_.
  - a) Lines
  - b) Dashed line
  - c) Diamonds
  - d) Double lines
- 5) \_\_\_\_\_ 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
- 6) A level that describes data stored in a database and the relationships among the data.
  - a) physical
  - b) logical
  - c) user
  - d) view
- 7) Which of the following is a NoSQL Database Type?
  - a) SQL
  - b) Document databases
  - c) JSON
  - d) All of the mentioned

- 8) Which statement is wrong about PRIMARY KEY constraint in SQL?
- a) The PRIMARY KEY uniquely identifies each record in a SQL database table
  - b) Primary key can be made based on multiple columns
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  - c) Outer join
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- 12) The description of a database is called \_\_\_\_\_.
- a) Snap shot
  - b) Schema
  - c) Valid state
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- 13) The data in the database at a particular moment in time is \_\_\_\_\_.
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I****Q.2 Solve any four** **16**

- a) Define the following terms:
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  - 2) Weak Entity
- b) Differentiate between logical data independence and physical data independence? Which one is harder to achieve and Why?
- c) What are database utilities? List a few common functions that the utilities perform.
- d) Explain with diagram 1 :N and M : N relationship types with example.
- e) Differentiate between.
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- f) Describe the three-schema architecture.

**Q.3 Solve any Two** **12**

- a) Draw and Explain Notations for ER diagram.
- b) Explain the Centralized architecture for DBMS.
- c) Draw an ER Diagram for following schema? State the assumption about cardinality and other constraints in the answer.

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**Section – II**

- Q.4 Solve any four** **16**
- a) Explain with example Insert and Update commands.
  - b) Explain the following join with example in SQL.
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<b>Seat No.</b>	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

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Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day &amp; 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 Solve any four** **16**

- a) Define the following terms:
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**Section – II**

- Q.4 Solve any four** **16**
- a) Explain with example Insert and Update commands.
  - b) Explain the following join with example in SQL.
    - 1) Inner Join.
    - 2) Full Outer Join.
  - c) How do you define big data? And Explain the three V's of characterized big data.
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- Q.5 Solve any two** **12**
- a) Describe the architecture of Hadoop?
  - b) Explain in brief B+ tree Index.
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Seat  
No.

**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

**Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 not a type of SQL statement?
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Seat No.	
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**B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATABASE MANAGEMENT SYSTEMS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I**

**Q.2 Solve any four** **16**

- a) Define the following terms:
  - 1) Data Abstraction
  - 2) Weak Entity
- b) Differentiate between logical data independence and physical data independence? Which one is harder to achieve and Why?
- c) What are database utilities? List a few common functions that the utilities perform.
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- f) Describe the three-schema architecture.

**Q.3 Solve any Two** **12**

- a) Draw and Explain Notations for ER diagram.
- b) Explain the Centralized architecture for DBMS.
- c) Draw an ER Diagram for following schema? State the assumption about cardinality and other constraints in the answer.

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stud\_dept(ID, dept\_name)

course\_dept(course\_id, dept\_name)

**Section – II****Q.4 Solve any four** **16**

- a) Explain with example Insert and Update commands.
- b) Explain the following join with example in SQL.
  - 1) Inner Join.
  - 2) Full Outer Join.
- c) How do you define big data? And Explain the three V's of characterized big data.
- d) How can hashing be used to construct an index?
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**Q.5 Solve any two** **12**

- a) Describe the architecture of Hadoop?
- b) Explain in brief B+ tree Index.
- c) Explain aggregation with example.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum 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 3 phase fully controlled rectifier the ripple frequency is \_\_\_\_\_.
  - a) Equal to the input frequency
  - b) Twice the input frequency
  - c) Three times the input frequency
  - d) Six times the input frequency
- 2) In Three phase full converter PIV across any thyristor is \_\_\_\_\_.
  - a)  $\sqrt{2}V_m$
  - b)  $\sqrt{3}V_m$
  - c)  $\sqrt{3}V_{LL}$
  - d)  $\sqrt{6}V_{LL}$
- 3) In thyristor de chopper \_\_\_\_\_ type of commutation results in best performance.
  - a) natural commutation
  - b) current commutation
  - c) load commutation
  - d) voltage commutation
- 4) A step up chopper has input dc voltage is 200 V and duty cycle of chopper is 0.667 Then output dc will be \_\_\_\_\_.
  - a) 333
  - b) 300
  - c) 133
  - d) 600
- 5) When we need to drive a dc motor at different speeds in both directions and also to brake it in both the directions, which one of the following would you use?
  - a) Dual Converter
  - b) Class E chopper
  - c) Jones chopper
  - d) Both a & b
- 6) A Cyclomultiplier is a \_\_\_\_\_.
  - a) AC to AC converter
  - b) DC to AC converter
  - c) AC to DC converter
  - d) Power Converter
- 7) The number of SCR's required for single phase midpoint cycloconverter and single phase bridge cycloconverter is \_\_\_\_\_.
  - a) 8, 4
  - b) 2, 4
  - c) 4, 16
  - d) 4, 8





Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All Questions are compulsory.  
 2) Figures to right indicate maximum marks.  
 3) Assume suitable data if required.

**Section – I**

**Q.2 Answer any four of the following question. 16**

- Explain operation of Three phase semi converter with highly inductive load. Derive the expression for  $V_{dc}$ . Draw neat waveform for  $\alpha = 90^\circ$
- Prove that for chopper circuit  $I_n = \left( \left( \frac{Fr}{nFch} \right)^2 \right)$  Justify "Resonance frequency is always less than chopping frequency".
- Explain working of class D chopper with suitable circuit diagram.
- Draw and explain the control circuit block diagram for cycloconverter with non circulating current mode.
- Derive an expression for circulating current of three phase dual converter & sketch associated waveforms.

**Q.3 Answer any two of the following question. 12**

- Explain operation of three phase full controlled bridge converter with inductive load. Derive the expression for  $V_{dc}$ ,  $I_{dc}$ . Draw voltage waveform for  $\alpha = 60^\circ$
- Explain working of Jones chopper with neat circuit diagram. Sketch associated voltage and current waveforms
- Explain operation of single phase bridge type step down cycloconverter for 5:1 frequency ratio. Sketch associated waveforms for resistive load. State application of cycloconverter.

**Section – II**

**Q.4 Answer any four of the following question. 16**

- Explain operation of single phase full bridge IGBT based voltage source inverter with Inductive load. Draw associated waveforms.
- With neat circuit diagram and appropriate waveforms explain working of improved parallel inverter with highly inductive load with associated waveforms.
- Explain working of harmonic reduction technique using stepped wave inverter
- Explain working of closed loop control of induction motor using stator voltage control method
- How a four quadrant operation can be obtained from a chopper fed DC drive

**Q.5 Solve any two of the following questions.**

- a) What is power factor corrector? Explain different power factor corrector method.
- b) Explain working of speed control of dc drive using fuzzy logic controller for two different cases
  - i) Control action below reference speed
  - ii) Control action above reference speed
- c) Explain working of single pulse modulation technique. Derive an expression of RMS output voltage. How it eliminates  $n^{\text{th}}$  harmonic component from output voltage.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

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

- 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 maximum marks.

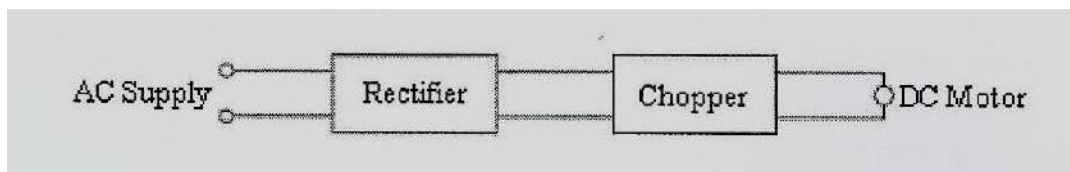
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) In a circuit high reactive power compared to apparent power indicates \_\_\_\_\_.  
 a) Poor power factor                      b) High power factor  
 c) Low efficiency                          d) Low power dissipation
- 2) For the large d.c. motor control shown below, if duty cycle of chopper circuit is increase then \_\_\_\_\_.



- a) motor speed will increase              b) motor speed will decrease  
 c) the speed will not be effected        d) None of above
- 3) In Single pulse modulation technique,  $n^{\text{th}}$  harmonic can be eliminated if pulse width is equal to \_\_\_\_\_.  
 a)  $2\frac{\pi}{n}$  rad                                      b)  $\frac{\pi}{n}$   
 c)  $2\frac{n}{\pi}$     d)  $\frac{n}{\pi}$
- 4) Sinusoidal pwm technique eliminates \_\_\_\_\_.  
 a) only one harmonic at a time            b) number of harmonic at a time  
 c) only even harmonics                      d) even and odd harmonics
- 5) Speed control of three phase AC motor can be obtained from \_\_\_\_\_.  
 a) 3 phase Cycloconveter  
 b) Three phase controlled rectifier  
 c) 1 phase bridge Inverter  
 d) Three phase dual converter
- 6) In Three phase  $120^\circ$  conduction mode \_\_\_\_\_.  
 a) At any instant of time two thyristors are ON  
 b) Triplen harmonics are absent  
 c) No possibility of short circuit  
 d) All above



Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All Questions are compulsory.  
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 3) Assume suitable data if required.

**Section – I**

**Q.2 Answer any four of the following question. 16**

- Explain operation of Three phase semi converter with highly inductive load. Derive the expression for  $V_{dc}$ . Draw neat waveform for  $\alpha = 90^\circ$
- Prove that for chopper circuit  $I_n = \left( \left( \frac{Fr}{nFch} \right)^2 \right)$  Justify "Resonance frequency is always less than chopping frequency".
- Explain working of class D chopper with suitable circuit diagram.
- Draw and explain the control circuit block diagram for cycloconverter with non circulating current mode.
- Derive an expression for circulating current of three phase dual converter & sketch associated waveforms.

**Q.3 Answer any two of the following question. 12**

- Explain operation of three phase full controlled bridge converter with inductive load. Derive the expression for  $V_{dc}$ ,  $I_{dc}$ . Draw voltage waveform for  $\alpha = 60^\circ$
- Explain working of Jones chopper with neat circuit diagram. Sketch associated voltage and current waveforms
- Explain operation of single phase bridge type step down cycloconverter for 5:1 frequency ratio. Sketch associated waveforms for resistive load. State application of cycloconverter.

**Section – II**

**Q.4 Answer any four of the following question. 16**

- Explain operation of single phase full bridge IGBT based voltage source inverter with Inductive load. Draw associated waveforms.
- With neat circuit diagram and appropriate waveforms explain working of improved parallel inverter with highly inductive load with associated waveforms.
- Explain working of harmonic reduction technique using stepped wave inverter
- Explain working of closed loop control of induction motor using stator voltage control method
- How a four quadrant operation can be obtained from a chopper fed DC drive

**Q.5 Solve any two of the following questions.**

- a) What is power factor corrector? Explain different power factor corrector method.
- b) Explain working of speed control of dc drive using fuzzy logic controller for two different cases
  - i) Control action below reference speed
  - ii) Control action above reference speed
- c) Explain working of single pulse modulation technique. Derive an expression of RMS output voltage. How it eliminates  $n^{\text{th}}$  harmonic component from output voltage.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
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**POWER ELECTRONICS**

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

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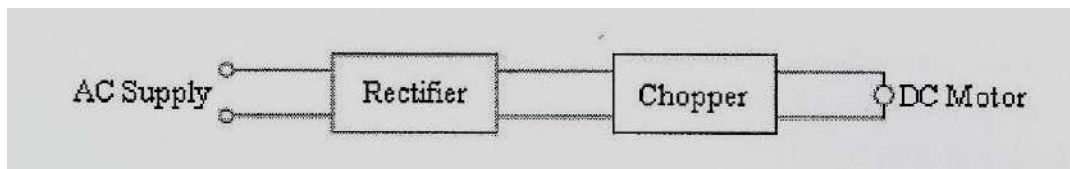
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) When we need to drive a dc motor at different speeds in both directions and also to brake it in both the directions, which one of the following would you use?
  - a) Dual Converter
  - b) Class E chopper
  - c) Jones chopper
  - d) Both a & b
- 2) A Cyclomultiplier is a \_\_\_\_\_.
  - a) AC to AC converter
  - b) DC to AC converter
  - c) AC to DC converter
  - d) Power Converter
- 3) The number of SCR's required for single phase midpoint cycloconverter and single phase bridge cycloconverter is \_\_\_\_\_.
  - a) 8, 4
  - b) 2, 4
  - c) 4, 16
  - d) 4, 8
- 4) In a circuit high reactive power compared to apparent power indicates \_\_\_\_\_.
  - a) Poor power factor
  - b) High power factor
  - c) Low efficiency
  - d) Low power dissipation
- 5) For the large d.c. motor control shown below, if duty cycle of chopper circuit is increase then \_\_\_\_.



- a) motor speed will increase
  - b) motor speed will decrease
  - c) the speed will not be effected
  - d) None of above
- 6) In Single pulse modulation technique,  $n^{\text{th}}$  harmonic can be eliminated if pulse width is equal to \_\_\_\_\_.
    - a)  $2\frac{\pi}{n}$  rad
    - b)  $\frac{\pi}{n}$
    - c)  $2\frac{n}{\pi}$
    - d)  $\frac{n}{\pi}$
  - 7) Sinusoidal pwm technique eliminates \_\_\_\_\_.
    - a) only one harmonic at a time
    - b) number of harmonic at a time
    - c) only even harmonics
    - d) even and odd harmonics

- 8) Speed control of three phase AC motor can be obtained from \_\_\_\_.
- 3 phase Cycloconverter
  - Three phase controlled rectifier
  - 1 phase bridge Inverter
  - Three phase dual converter
- 9) In Three phase  $120^\circ$  conduction mode \_\_\_\_.
- At any instant of time two thyristors are ON
  - Triplen harmonics are absent
  - No possibility of short circuit
  - All above
- 10) In \_\_\_\_\_ Inverter output frequency is depends on commutating component.
- Parallel
  - Series
  - Improved parallel inverter
  - Both a & c
- 11) In a 3 phase fully controlled rectifier the ripple frequency is \_\_\_\_.
- Equal to the input frequency
  - Twice the input frequency
  - Three times the input frequency
  - Six times the input frequency
- 12) In Three phase full converter PIV across any thyristor is \_\_\_\_.
- $\sqrt{2}V_m$
  - $\sqrt{3}V_m$
  - $\sqrt{3}V_{LL}$
  - $\sqrt{6}V_{LL}$
- 13) In thyristor chopper \_\_\_\_\_ type of commutation results in best performance.
- natural commutation
  - current commutation
  - load commutation
  - voltage commutation
- 14) A step up chopper has input dc voltage is 200 V and duty cycle of chopper is 0.667 Then output dc will be \_\_\_\_.
- 333
  - 300
  - 133
  - 600



Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All Questions are compulsory.  
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**Section – I**

**Q.2 Answer any four of the following question. 16**

- a) Explain operation of Three phase semi converter with highly inductive load. Derive the expression for  $V_{dc}$ . Draw neat waveform for  $\alpha = 90^\circ$
- b) Prove that for chopper circuit  $I_n = \left( \left( \frac{Fr}{nFch} \right)^2 \right)$  Justify "Resonance frequency is always less than chopping frequency".
- c) Explain working of class D chopper with suitable circuit diagram.
- d) Draw and explain the control circuit block diagram for cycloconverter with non circulating current mode.
- e) Derive an expression for circulating current of three phase dual converter & sketch associated waveforms.

**Q.3 Answer any two of the following question. 12**

- a) Explain operation of three phase full controlled bridge converter with inductive load. Derive the expression for  $V_{dc}$ ,  $I_{dc}$ . Draw voltage waveform for  $\alpha = 60^\circ$
- b) Explain working of Jones chopper with neat circuit diagram. Sketch associated voltage and current waveforms
- c) Explain operation of single phase bridge type step down cycloconverter for 5:1 frequency ratio. Sketch associated waveforms for resistive load. State application of cycloconverter.

**Section – II**

**Q.4 Answer any four of the following question. 16**

- a) Explain operation of single phase full bridge IGBT based voltage source inverter with Inductive load. Draw associated waveforms.
- b) With neat circuit diagram and appropriate waveforms explain working of improved parallel inverter with highly inductive load with associated waveforms.
- c) Explain working of harmonic reduction technique using stepped wave inverter
- d) Explain working of closed loop control of induction motor using stator voltage control method
- e) How a four quadrant operation can be obtained from a chopper fed DC drive

**Q.5 Solve any two of the following questions.**

- a) What is power factor corrector? Explain different power factor corrector method.
- b) Explain working of speed control of dc drive using fuzzy logic controller for two different cases
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Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**POWER ELECTRONICS**

Day & Date: Saturday, 07-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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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 Single pulse modulation technique,  $n^{\text{th}}$  harmonic can be eliminated if pulse width is equal to \_\_\_\_\_.
 

a) $2\frac{\pi}{n}$ rad	b) $\frac{\pi}{n}$
c) $2\frac{n}{\pi}$	d) $\frac{n}{\pi}$
- 2) Sinusoidal pwm technique eliminates \_\_\_\_\_.
 

a) only one harmonic at a time	b) number of harmonic at a time
c) only even harmonics	d) even and odd harmonics
- 3) Speed control of three phase AC motor can be obtained from \_\_\_\_\_.
 

a) 3 phase Cycloconverter
b) Three phase controlled rectifier
c) 1 phase bridge Inverter
d) Three phase dual converter
- 4) In Three phase  $120^\circ$  conduction mode \_\_\_\_\_.
 

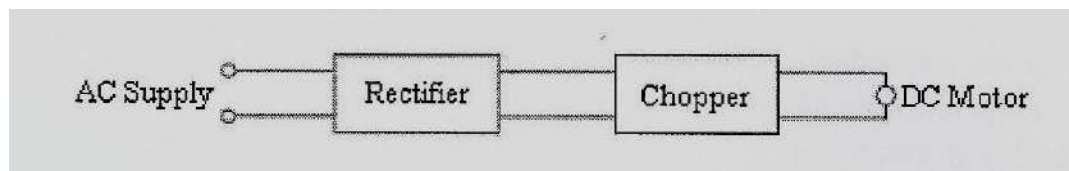
a) At any instant of time two thyristors are ON
b) Triplen harmonics are absent
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d) All above
- 5) In \_\_\_\_\_ Inverter output frequency is depends on commutating component.
 

a) Parallel	b) Series
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- 6) In a 3 phase fully controlled rectifier the ripple frequency is \_\_\_\_\_.
 

a) Equal to the input frequency
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- 7) In Three phase full converter PIV across any thyristor is \_\_\_\_\_.
 

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- a) natural commutation                      b) current commutation  
c) load commutation                         d) voltage commutation
- 9) A step up chopper has input dc voltage is 200 V and duty cycle of chopper is 0.667 Then output dc will be \_\_\_\_\_.
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- 10) When we need to drive a dc motor at different speeds in both directions and also to brake it in both the directions, which one of the following would you use?
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- 11) A Cycloconverter is a \_\_\_\_\_.
- a) AC to AC converter                         b) DC to AC converter  
c) AC to DC converter                        d) Power Converter
- 12) The number of SCR's required for single phase midpoint cycloconverter and single phase bridge cycloconverter is \_\_\_\_\_.
- a) 8, 4    b) 2, 4  
c) 4, 16    d) 4, 8
- 13) In a circuit high reactive power compared to apparent power indicates \_\_\_\_\_.
- a) Poor power factor                            b) High power factor  
c) Low efficiency                                d) Low power dissipation
- 14) For the large d.c. motor control shown below, if duty cycle of chopper circuit is increase then \_\_\_\_\_.



- a) motor speed will increase                b) motor speed will decrease  
c) the speed will not be effected            d) None of above

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
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**Section – I**

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**Section – II**

**Q.4 Answer any four of the following question. 16**

- Explain operation of single phase full bridge IGBT based voltage source inverter with Inductive load. Draw associated waveforms.
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- c) Explain working of single pulse modulation technique. Derive an expression of RMS output voltage. How it eliminates  $n^{\text{th}}$  harmonic component from output voltage.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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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 layer provides the services to user?
  - a) Application
  - b) Transport
  - c) Physical
  - d) Session
- 2) Bits are packaged into frames at which layer of the OSI model?
  - a) session layer
  - b) network layer
  - c) data link layer
  - d) application layer
- 3) Encryption takes place at which layer?
  - a) Application
  - b) presentation
  - c) data link
  - d) physical
- 4) Packets are found at which layer?
  - a) application
  - b) transport
  - c) data link
  - d) physical
- 5) In \_\_\_\_\_ error correction, the receiver corrects errors without requesting retransmission.
  - a) onward
  - b) backward
  - c) forward
  - d) none of given
- 6) Which device is used to connect two systems, specially two systems uses different protocols?
  - a) hub
  - b) router
  - c) gateway
  - d) bridge
- 7) Which LAN topology requires central controller or hub?
  - a) star
  - b) bus
  - c) mesh
  - d) ring
- 8) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is number of the \_\_\_\_\_ byte carried in that segment.
  - a) first
  - b) last
  - c) central
  - d) none of mentioned
- 9) UDP packets have fixed-size header of \_\_\_\_\_ bytes.
  - a) 8
  - b) 16
  - c) 32
  - d) 64
- 10) What range of addresses are used in first octet of Class-C IPv4 address?
  - a) 192-233
  - b) 203-233
  - c) 1-127
  - d) 129-192





Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
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Max. Marks: 56

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

**Q.2 Answer any Four.** **16**

- a) What are collision oriented, collision less and limited collision MAC protocols? Explain one collision free and one collision oriented MAC protocol.
- b) List different networking devices and describe functioning of each device. Discuss stop\_and\_wait flow control mechanism. Why this mechanism is unsuitable for short distance communication?
- c) What are error correction methods of error control methods? Explain each shortly. Find transmitted data word if a transmitter used CRC mechanism for error control, the data is 110010101 and divisor is 10101.
- d) What are different types of stations and different modes of data transfer related to HDLC?
- e) Draw different LAN topologies and compare them on the basis of maintenance and expansion issues.

**Q.3 Answer any Two.** **12**

- a) Draw different HDLC frame formats and discuss operation of each field. What is extended mode in HDLC?
- b) Draw IEEE 802.5 MAC sublayer and describe importance of each field. How data delivery is acknowledged in IEEE 802.5 LAN?
- c) Write different assumptions made in dynamic channel allocation. Discuss bit map and binary countdown protocols in detail.

**Section – II**

**Q.4 Answer any Four.** **16**

- a) Draw TCP/IP reference model and explain it in detail. What is encapsulation and decapsulation in TCP/IP?
- b) Draw UDP header format and describe. Why UDP is less reliable?
- c) Write the syntax of network commands-hostname, ping, ipconfig, netstat and traceroute and explain their use.
- d) What is the need of ARP? Draw the ARP Message format and discuss significance of each field.
- e) Explain three way handshake process in case of TCP for connection establishment.

**Q.5 Attempt any Two.** **12**

- a) Draw IPv4 header format and describe each field.
- b) What are the issues handled in network layer? Discuss distance vector routing protocol.
- c) Explain the terms MSS, window size and threshold related to TCP congestion control algorithm. Discuss TCP congestion control protocol in detail.

Seat No.	
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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) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is number of the \_\_\_\_\_ byte carried in that segment.
 

a) first	b) last
c) central	d) none of mentioned
- 2) UDP packets have fixed-size header of \_\_\_\_\_ bytes.
 

a) 8	b) 16
c) 32	d) 64
- 3) What range of addresses are used in first octet of Class-C IPv4 address?
 

a) 192-233	b) 203-233
c) 1-127	d) 129-192
- 4) Which protocol does use \_\_\_\_\_ operation?
 

a) TCP	b) ARP
c) ICMP	d) UDP
- 5) Packets of data that is transported by IP is called \_\_\_\_\_.
 

a) segment	b) message
c) data chunk	d) datagram
- 6) Term that refers to associate a logical address with a physical address is \_\_\_\_\_.
 

a) RARP	b) ARP
c) ICMP	d) IGMP
- 7) IPv4 uses \_\_\_\_\_ bits for addressing.
 

a) 16	b) 8
c) 31	d) 32
- 8) Which layer provides the services to user?
 

a) Application	b) Transport
c) Physical	d) Session
- 9) Bits are packaged into frames at which layer of the OSI model?
 

a) session layer	b) network layer
c) data link layer	d) application layer
- 10) Encryption takes place at which layer?
 

a) Application	b) presentation
c) data link	d) physical

- 11) Packets are found at which layer?
- a) application
  - b) transport
  - c) data link
  - d) physical
- 12) In \_\_\_\_\_ error correction, the receiver corrects errors without requesting retransmission.
- a) onward
  - b) backward
  - c) forward
  - d) none of given
- 13) Which device is used to connect two systems, specially two systems uses different protocols?
- a) hub
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  - c) gateway
  - d) bridge
- 14) Which LAN topology requires central controller or hub?
- a) star
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  - c) mesh
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
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**Q.2 Answer any Four.** **16**

- a) What are collision oriented, collision less and limited collision MAC protocols? Explain one collision free and one collision oriented MAC protocol.
- b) List different networking devices and describe functioning of each device. Discuss stop\_and\_wait flow control mechanism. Why this mechanism is unsuitable for short distance communication?
- c) What are error correction methods of error control methods? Explain each shortly. Find transmitted data word if a transmitter used CRC mechanism for error control, the data is 110010101 and divisor is 10101.
- d) What are different types of stations and different modes of data transfer related to HDLC?
- e) Draw different LAN topologies and compare them on the basis of maintenance and expansion issues.

**Q.3 Answer any Two.** **12**

- a) Draw different HDLC frame formats and discuss operation of each field. What is extended mode in HDLC?
- b) Draw IEEE 802.5 MAC sublayer and describe importance of each field. How data delivery is acknowledged in IEEE 802.5 LAN?
- c) Write different assumptions made in dynamic channel allocation. Discuss bit map and binary countdown protocols in detail.

**Section – II**

**Q.4 Answer any Four.** **16**

- a) Draw TCP/IP reference model and explain it in detail. What is encapsulation and decapsulation in TCP/IP?
- b) Draw UDP header format and describe. Why UDP is less reliable?
- c) Write the syntax of network commands-hostname, ping, ipconfig, netstat and traceroute and explain their use.
- d) What is the need of ARP? Draw the ARP Message format and discuss significance of each field.
- e) Explain three way handshake process in case of TCP for connection establishment.

**Q.5 Attempt any Two.** **12**

- a) Draw IPv4 header format and describe each field.
- b) What are the issues handled in network layer? Discuss distance vector routing protocol.
- c) Explain the terms MSS, window size and threshold related to TCP congestion control algorithm. Discuss TCP congestion control protocol in detail.

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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 \_\_\_\_\_ error correction, the receiver corrects errors without requesting retransmission.
 

a) onward	b) backward
c) forward	d) none of given
- 2) Which device is used to connect two systems, specially two systems uses different protocols?
 

a) hub	b) router
c) gateway	d) bridge
- 3) Which LAN topology requires central controller or hub?
 

a) star	b) bus
c) mesh	d) ring
- 4) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is number of the \_\_\_\_\_ byte carried in that segment.
 

a) first	b) last
c) central	d) none of mentioned
- 5) UDP packets have fixed-size header of \_\_\_\_\_ bytes.
 

a) 8	b) 16
c) 32	d) 64
- 6) What range of addresses are used in first octet of Class-C IPv4 address?
 

a) 192-233	b) 203-233
c) 1-127	d) 129-192
- 7) Which protocol does use \_\_\_\_\_ operation?
 

a) TCP	b) ARP
c) ICMP	d) UDP
- 8) Packets of data that is transported by IP is called \_\_\_\_\_.
 

a) segment	b) message
c) data chunk	d) datagram
- 9) Term that refers to associate a logical address with a physical address is \_\_\_\_\_.
 

a) RARP	b) ARP
c) ICMP	d) IGMP

- 10) IPv4 uses \_\_\_\_\_ bits for addressing.
- |       |       |
|-------|-------|
| a) 16 | b) 8  |
| c) 31 | d) 32 |
- 11) Which layer provides the services to user?
- |                |              |
|----------------|--------------|
| a) Application | b) Transport |
| c) Physical    | d) Session   |
- 12) Bits are packaged into frames at which layer of the OSI model?
- |                    |                      |
|--------------------|----------------------|
| a) session layer   | b) network layer     |
| c) data link layer | d) application layer |
- 13) Encryption takes place at which layer?
- |                |                 |
|----------------|-----------------|
| a) Application | b) presentation |
| c) data link   | d) physical     |
- 14) Packets are found at which layer?
- |                |              |
|----------------|--------------|
| a) application | b) transport |
| c) data link   | d) physical  |

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

**Q.2 Answer any Four.** **16**

- a) What are collision oriented, collision less and limited collision MAC protocols? Explain one collision free and one collision oriented MAC protocol.
- b) List different networking devices and describe functioning of each device. Discuss stop\_and\_wait flow control mechanism. Why this mechanism is unsuitable for short distance communication?
- c) What are error correction methods of error control methods? Explain each shortly. Find transmitted data word if a transmitter used CRC mechanism for error control, the data is 110010101 and divisor is 10101.
- d) What are different types of stations and different modes of data transfer related to HDLC?
- e) Draw different LAN topologies and compare them on the basis of maintenance and expansion issues.

**Q.3 Answer any Two.** **12**

- a) Draw different HDLC frame formats and discuss operation of each field. What is extended mode in HDLC?
- b) Draw IEEE 802.5 MAC sublayer and describe importance of each field. How data delivery is acknowledged in IEEE 802.5 LAN?
- c) Write different assumptions made in dynamic channel allocation. Discuss bit map and binary countdown protocols in detail.

**Section – II**

**Q.4 Answer any Four.** **16**

- a) Draw TCP/IP reference model and explain it in detail. What is encapsulation and decapsulation in TCP/IP?
- b) Draw UDP header format and describe. Why UDP is less reliable?
- c) Write the syntax of network commands-hostname, ping, ipconfig, netstat and traceroute and explain their use.
- d) What is the need of ARP? Draw the ARP Message format and discuss significance of each field.
- e) Explain three way handshake process in case of TCP for connection establishment.

**Q.5 Attempt any Two.** **12**

- a) Draw IPv4 header format and describe each field.
- b) What are the issues handled in network layer? Discuss distance vector routing protocol.
- c) Explain the terms MSS, window size and threshold related to TCP congestion control algorithm. Discuss TCP congestion control protocol in detail.





- 11) Which device is used to connect two systems, specially two systems uses different protocols?
- a) hub
  - b) router
  - c) gateway
  - d) bridge
- 12) Which LAN topology requires central controller or hub?
- a) star
  - b) bus
  - c) mesh
  - d) ring
- 13) TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is number of the \_\_\_\_\_ byte carried in that segment.
- a) first
  - b) last
  - c) central
  - d) none of mentioned
- 14) UDP packets have fixed-size header of \_\_\_\_\_ bytes.
- a) 8
  - b) 16
  - c) 32
  - d) 64

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**COMPUTER NETWORKS**

Day & Date: Tuesday, 10-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

**Q.2 Answer any Four.** **16**

- a) What are collision oriented, collision less and limited collision MAC protocols? Explain one collision free and one collision oriented MAC protocol.
- b) List different networking devices and describe functioning of each device. Discuss stop\_and\_wait flow control mechanism. Why this mechanism is unsuitable for short distance communication?
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- b) Draw IEEE 802.5 MAC sublayer and describe importance of each field. How data delivery is acknowledged in IEEE 802.5 LAN?
- c) Write different assumptions made in dynamic channel allocation. Discuss bit map and binary countdown protocols in detail.

**Section – II**

**Q.4 Answer any Four.** **16**

- a) Draw TCP/IP reference model and explain it in detail. What is encapsulation and decapsulation in TCP/IP?
- b) Draw UDP header format and describe. Why UDP is less reliable?
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- d) What is the need of ARP? Draw the ARP Message format and discuss significance of each field.
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**Q.5 Attempt any Two.** **12**

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- b) What are the issues handled in network layer? Discuss distance vector routing protocol.
- c) Explain the terms MSS, window size and threshold related to TCP congestion control algorithm. Discuss TCP congestion control protocol in detail.

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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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 these is not true for TDD?
  - a) TDD uses different time slots for transmission and reception paths
  - b) Single radio frequency can be used
  - c) Duplexer is required
  - d) It increases the battery life of mobile phones
- 2) The connectivity from exchange to customer premises is termed as \_\_\_\_\_.
  - a) Data network
  - b) Access Network or Local Loop
  - c) Bridge network
  - d) None of the above
- 3) The process of channel coding, Encryption, Multiplexing and modulation for Trans direction and reverse for reception are to be carried out by \_\_\_\_\_.
  - a) BTS
  - b) BSC
  - c) MSC
  - d) MS
- 4) The CDMA system has a soft capacity limit. That is increasing the number of users will \_\_\_\_\_ the system performance.
  - a) increases
  - b) decreases
  - c) stabilise
  - d) none of the above
- 5) CDMA base stations consumes \_\_\_\_\_ power than GSM and also covers a \_\_\_\_\_ distance.
  - a) more, large
  - b) less, large
  - c) less, less
  - d) none of the above
- 6) The cell size in CDMA is \_\_\_\_\_ compared to GSM.
  - a) larger
  - b) smaller
  - c) same
  - d) none of the above
- 7) Which of this is the interface between MS & BSS?
  - a) Um
  - b) A
  - c) Abis
  - d) None of the above
- 8) Which of this is the interface between BTS and BSC?
  - a) Um
  - b) A
  - c) Abis
  - d) None of the above



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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any four. 16**
- a) How signal spreading is achieved using FHSS?
  - b) With suitable example discuss effect of  $\Delta$  on handoff.
  - c) Explain Blocked Calls Delayed Trunking.
  - d) Discuss limitations of CDMA.
  - e) With suitable example discuss relationship between number of users, no of cells per cluster and number of clusters.

- Q.3 Attempt any two. 12**
- a) Explain wireless MAC - Reservation ALOHA. What are its advantages?
  - b) Explain long code scrambling in forward traffic channel in detail for CDMA-IS95.
  - c) Explain TCH/FS, SACCH & FACCH channel coding in GSM signal processing.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Explain its advantages & disadvantages with suitable examples of WLAN.
  - b) What is DHCP? What are its applications?
  - c) What are the characteristics of a mobile environment?
  - d) What were the design goals of Bluetooth?
  - e) What is encapsulation? Why it is required?

- Q.5 Attempt any two. 12**
- a) Describe infrastructure architecture for WLAN. Explain its advantages & disadvantages with suitable examples.
  - b) With suitable diagram & explain how a scatternet is formed and data can be exchanged between two piconets.
  - c) With suitable example and signal diagram; explain optimization in mobile IP.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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 this is the interface between BTS and BSC?
  - a) Um
  - b) A
  - c) Abis
  - d) None of the above
- 2) Which of this is the interface within the GSM network architecture between the BSS (Base Station Subsystem) and an MSC (Mobile Switching Centre)?
  - a) A
  - b) B
  - c) C
  - d) D
- 3) The smallest inter frame spacing in MAC of 802.11 is \_\_\_\_\_.
  - a) DIFS
  - b) PIFS
  - c) SIFS
  - d) QIFS
- 4) RFCOMM in a Bluetooth Protocol Stack is a \_\_\_\_\_ Interface.
  - a) Host Controller
  - b) Link Control
  - c) Serial Line
  - d) Radio Frequency
- 5) Bluetooth is the wireless technology for \_\_\_\_\_.
  - a) local area network
  - b) personal area network
  - c) both (a) and (b)
  - d) none of the mentioned
- 6) Mostly \_\_\_\_\_ is used in wireless LAN.
  - a) time division multiplexing
  - b) orthogonal frequency division multiplexing
  - c) space division multiplexing
  - d) none of the mentioned
- 7) IP assigned for a client by DHCP server is \_\_\_\_\_.
  - a) for a limited period
  - b) for unlimited period
  - c) not time dependent
  - d) none of the mentioned
- 8) Which of these is not true for TDD?
  - a) TDD uses different time slots for transmission and reception paths
  - b) Single radio frequency can be used
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  - d) It increases the battery life of mobile phones

- 9) The connectivity from exchange to customer premises is termed as \_\_\_\_.
- a) Data network
  - b) Access Network or Local Loop
  - c) Bridge network
  - d) None of the above
- 10) The process of channel coding, Encryption, Multiplexing and modulation for Trans direction and reverse for reception are to be carried out by \_\_\_\_.
- a) BTS
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- 11) The CDMA system has a soft capacity limit. That is increasing the number of users will \_\_\_\_\_ the system performance.
- a) increases
  - b) decreases
  - c) stabilise
  - d) none of the above
- 12) CDMA base stations consumes \_\_\_\_\_ power than GSM and also covers a \_\_\_\_\_ distance.
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- 13) The cell size in CDMA is \_\_\_\_\_ compared to GSM.
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- 14) Which of this is the interface between MS & BSS?
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  - d) None of the above

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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any four.** **16**
- a) How signal spreading is achieved using FHSS?
  - b) With suitable example discuss effect of  $\Delta$  on handoff.
  - c) Explain Blocked Calls Delayed Trunking.
  - d) Discuss limitations of CDMA.
  - e) With suitable example discuss relationship between number of users, no of cells per cluster and number of clusters.

- Q.3 Attempt any two.** **12**
- a) Explain wireless MAC - Reservation ALOHA. What are its advantages?
  - b) Explain long code scrambling in forward traffic channel in detail for CDMA-IS95.
  - c) Explain TCH/FS, SACCH & FACCH channel coding in GSM signal processing.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) Explain its advantages & disadvantages with suitable examples of WLAN.
  - b) What is DHCP? What are its applications?
  - c) What are the characteristics of a mobile environment?
  - d) What were the design goals of Bluetooth?
  - e) What is encapsulation? Why it is required?

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  - b) With suitable diagram & explain how a scatternet is formed and data can be exchanged between two piconets.
  - c) With suitable example and signal diagram; explain optimization in mobile IP.



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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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**

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a) BTS                      b) BSC  
c) MSC                      d) MS
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a) increases                      b) decreases  
c) stabilise                      d) none of the above

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any four.** **16**
- a) How signal spreading is achieved using FHSS?
  - b) With suitable example discuss effect of  $\Delta$  on handoff.
  - c) Explain Blocked Calls Delayed Trunking.
  - d) Discuss limitations of CDMA.
  - e) With suitable example discuss relationship between number of users, no of cells per cluster and number of clusters.
- Q.3 Attempt any two.** **12**
- a) Explain wireless MAC - Reservation ALOHA. What are its advantages?
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**Section – II**

- Q.4 Attempt any four.** **16**
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  - b) With suitable diagram & explain how a scatternet is formed and data can be exchanged between two piconets.
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  - b) B
  - c) C
  - d) D

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MOBILE TECHNOLOGY**

Day & Date: Thursday, 12-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any four.** **16**
- a) How signal spreading is achieved using FHSS?
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  - d) Discuss limitations of CDMA.
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  - c) Explain TCH/FS, SACCH & FACCH channel coding in GSM signal processing.

**Section – II**

- Q.4 Attempt any four.** **16**
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  - b) What is DHCP? What are its applications?
  - c) What are the characteristics of a mobile environment?
  - d) What were the design goals of Bluetooth?
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- Q.5 Attempt any two.** **12**
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  - b) With suitable diagram & explain how a scatternet is formed and data can be exchanged between two piconets.
  - c) With suitable example and signal diagram; explain optimization in mobile IP.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

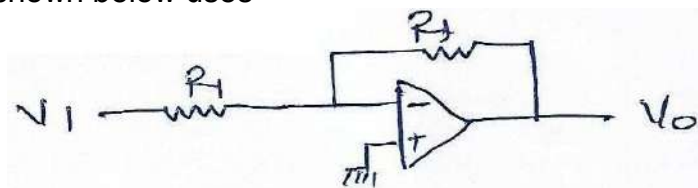
Duration: 30 Minutes

Marks: 14

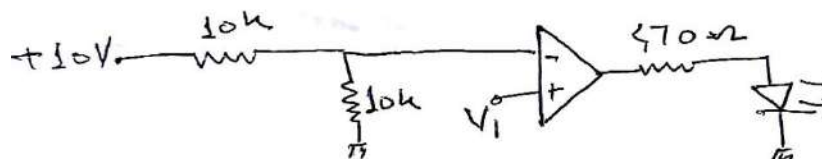
**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The consumer a product should satisfy the requirements such as \_\_\_\_\_.
  - a) The reliability must be good
  - b) The ergonomic and aesthetic are prime requirements
  - c) Its cost must be low
  - d) All the above
- 2) The main advantage of logic analyzer compared to oscilloscope is \_\_\_\_\_.
  - a) More number of channels
  - b) Multiple trigger levels
  - c) Both a) and b)
  - d) None of above
- 3) The DPO uses \_\_\_\_\_ processing architecture
  - a) Series
  - b) Parallel
  - c) Anti-parallel
  - d) None of above
- 4) MOV stands for \_\_\_\_\_.
  - a) Metal oxide varistors
  - b) Metal oxigen varistors
  - c) Metal oxide variable
  - d) none of the above
- 5) The circuit shown below uses



- a) voltage series feedback
  - b) voltage shunt feedback
  - c) current series feedback
  - d) current shunt feedback
- 6) In the circuit shown below LED will be ON if V1 is \_\_\_\_\_.



- a) >10 V
  - b) <10 V
  - c) > 5 V
  - d) <5 V





<b>Seat No.</b>	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- a) Classify and compare electronics product.
  - b) State and explain features of DSO.
  - c) Compare centralized power architecture and distributed power architecture.
  - d) Draw and explain off-the-line power supply.
  - e) Describe the noise and error consideration in signal processing.
- Q.3 Attempt any two. 12**
- a) Explain operation of logic analyzer using block diagram.
  - b) Draw and explain instrumentation amplifier.
  - c) Explain different protection circuits of SMPS.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Write short note on software design documentation.
  - b) Discuss different criteria while deciding the module in structured program.
  - c) Explain the humidity testing.
  - d) Write a short note on radiated emission test.
  - e) Differentiate the contents of service manual, engineering diary, and user manual.
- Q.5 Attempt any two. 12**
- a) Write recommended steps in software development of real life processor based product.
  - b) State and explain the importance of the IEC standard. Explain UL certification.
  - c) Explain in detail the user manual for any user product.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

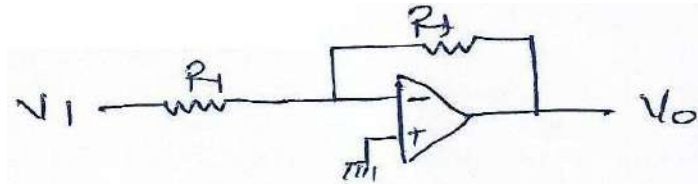
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

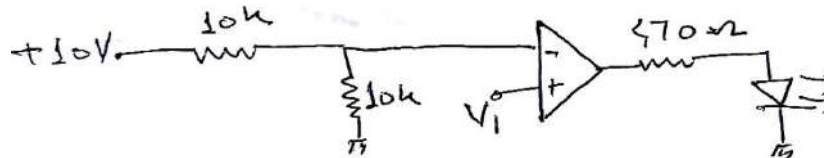
**14**

- 1) Testing or debugging of program is done by \_\_\_\_\_ approach.
  - a) Bottom-up
  - b) Up-down
  - c) Both a) and b)
  - d) None of the above
- 2) A computer program is used to translate between lower level representations of the computer program is called \_\_\_\_\_.
  - a) Compiler
  - b) Assembler
  - c) Cross-compiler
  - d) All the above
- 3) The \_\_\_\_\_ is used to translate the source code to a lower level language.
  - a) Compiler
  - b) Assembler
  - c) Cross-compiler
  - d) Macro-assembler
- 4) In mechanical shock, the pulse width is in \_\_\_\_\_.
  - a) Seconds
  - b) Microseconds
  - c) Milliseconds
  - d) Nanoseconds
- 5) CE marking is the \_\_\_\_\_.
  - a) Canadian conformity
  - b) European conformity
  - c) Japanese conformity
  - d) American conformity
- 6) The document used for the groundwork of a product is \_\_\_\_\_.
  - a) Proposal
  - b) Manual
  - c) Memo
  - d) Engineering diary
- 7) Which of the following PCB document consists of a part list with quantity and cost?
  - a) Bill of material
  - b) Artwork and layout
  - c) Memo
  - d) Assembly drawing
- 8) The consumer a product should satisfy the requirements such as \_\_\_\_\_.
  - a) The reliability must be good
  - b) The ergonomic and aesthetic are prime requirements
  - c) Its cost must be low
  - d) All the above
- 9) The main advantage of logic analyzer compared to oscilloscope is \_\_\_\_\_.
  - a) More number of channels
  - b) Multiple trigger levels
  - c) Both a) and b)
  - d) None of above

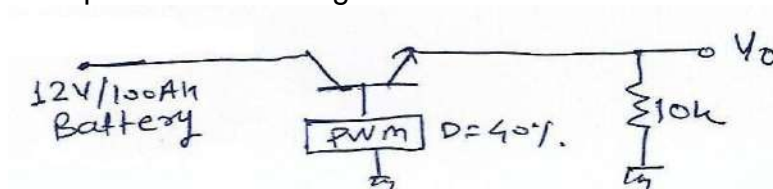
- 10) The DPO uses \_\_\_\_\_ processing architecture  
 a) Series  
 b) Parallel  
 c) Anti-parallel  
 d) None of above
- 11) MOV stands for \_\_\_\_\_.  
 a) Metal oxide varistors  
 b) Metal oxigen varistors  
 c) Metal oxide variable  
 d) none of the above
- 12) The circuit shown below uses



- a) voltage series feedback  
 b) voltage shunt feedback  
 c) current series feedback  
 d) current shunt feedback
- 13) In the circuit shown below LED will be ON if V1 is \_\_\_\_\_.



- a) >10 V  
 b) <10 V  
 c) > 5 V  
 d) <5 V
- 14) What is the output of the following circuit?



- a) 58 V  
 b) 4.8 V  
 c) 0.48 V  
 d) 0.58 V

<b>Seat No.</b>	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

- Q.2 Attempt any four. 16**
- a) Classify and compare electronics product.
  - b) State and explain features of DSO.
  - c) Compare centralized power architecture and distributed power architecture.
  - d) Draw and explain off-the-line power supply.
  - e) Describe the noise and error consideration in signal processing.
- Q.3 Attempt any two. 12**
- a) Explain operation of logic analyzer using block diagram.
  - b) Draw and explain instrumentation amplifier.
  - c) Explain different protection circuits of SMPS.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Write short note on software design documentation.
  - b) Discuss different criteria while deciding the module in structured program.
  - c) Explain the humidity testing.
  - d) Write a short note on radiated emission test.
  - e) Differentiate the contents of service manual, engineering diary, and user manual.
- Q.5 Attempt any two. 12**
- a) Write recommended steps in software development of real life processor based product.
  - b) State and explain the importance of the IEC standard. Explain UL certification.
  - c) Explain in detail the user manual for any user product.

Seat No.	
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Set	R
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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**MCQ/Objective Type Questions**

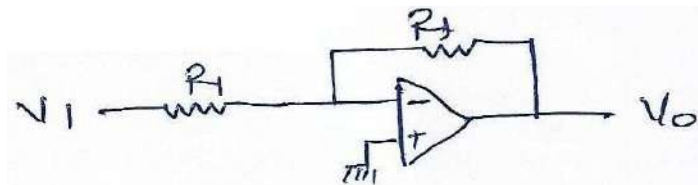
Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

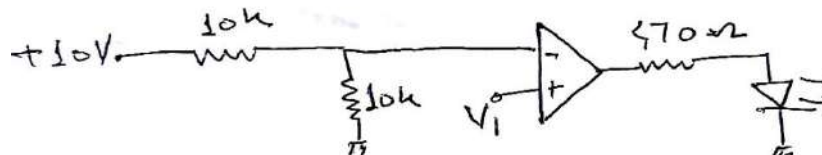
**14**

- 1) The circuit shown below uses



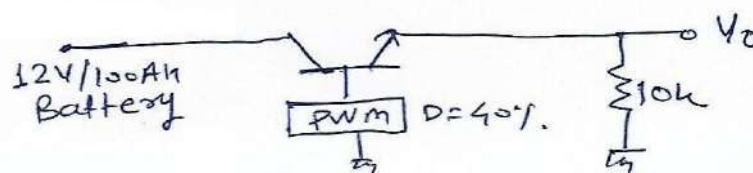
- a) voltage series feedback      b) voltage shunt feedback  
c) current series feedback      d) current shunt feedback

- 2) In the circuit shown below LED will be ON if V1 is \_\_\_\_.



- a) >10 V      b) <10 V  
c) > 5 V      d) <5 V

- 3) What is the output of the following circuit?



- a) 58 V      b) 4.8 V  
c) 0.48 V      d) 0.58 V

- 4) Testing or debugging of program is done by \_\_\_\_ approach.  
a) Bottom-up      b) Up-down  
c) Both a) and b)      d) None of the above
- 5) A computer program is used to translate between lower level representations of the computer program is called \_\_\_\_.  
a) Compiler      b) Assembler  
c) Cross-compiler      d) All the above

- 6) The \_\_\_\_\_ is used to translate the source code to a lower level language.
- a) Compiler
  - b) Assembler
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- 7) In mechanical shock, the pulse width is in \_\_\_\_\_.
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- a) More number of channels
  - b) Multiple trigger levels
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  - d) None of above
- 13) The DPO uses \_\_\_\_\_ processing architecture
- a) Series
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  - c) Anti-parallel
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- a) Metal oxide varistors
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  - c) Metal oxide variable
  - d) none of the above

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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

- Q.2 Attempt any four. 16**
- a) Classify and compare electronics product.
  - b) State and explain features of DSO.
  - c) Compare centralized power architecture and distributed power architecture.
  - d) Draw and explain off-the-line power supply.
  - e) Describe the noise and error consideration in signal processing.
- Q.3 Attempt any two. 12**
- a) Explain operation of logic analyzer using block diagram.
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  - c) Explain different protection circuits of SMPS.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Write short note on software design documentation.
  - b) Discuss different criteria while deciding the module in structured program.
  - c) Explain the humidity testing.
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- a) Write recommended steps in software development of real life processor based product.
  - b) State and explain the importance of the IEC standard. Explain UL certification.
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) The \_\_\_\_\_ is used to translate the source code to a lower level language.
 

a) Compiler	b) Assembler
c) Cross-compiler	d) Macro-assembler
- 2) In mechanical shock, the pulse width is in \_\_\_\_\_.
 

a) Seconds	b) Microseconds
c) Milliseconds	d) Nanoseconds
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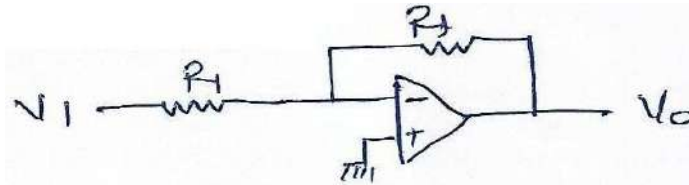
a) More number of channels	b) Multiple trigger levels
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- 8) The DPO uses \_\_\_\_\_ processing architecture
 

a) Series	b) Parallel
c) Anti-parallel	d) None of above
- 9) MOV stands for \_\_\_\_\_.
 

a) Metal oxide varistors	b) Metal oxigen varistors
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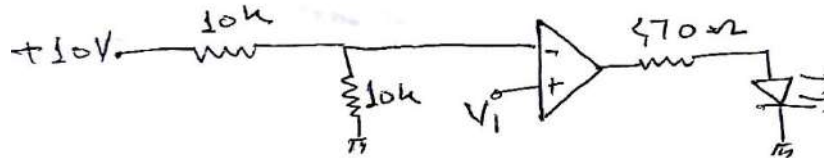


10) The circuit shown below uses



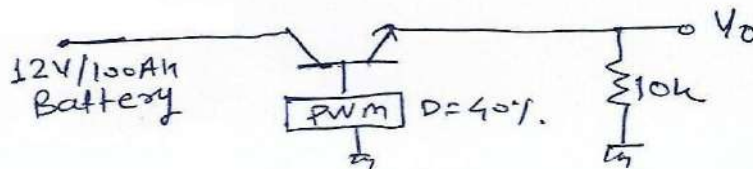
- a) voltage series feedback
- b) voltage shunt feedback
- c) current series feedback
- d) current shunt feedback

11) In the circuit shown below LED will be ON if V1 is \_\_\_\_\_.



- a) >10 V
- b) <10 V
- c) > 5 V
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12) What is the output of the following circuit?



- a) 58 V
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- a) Bottom-up
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14) A computer program is used to translate between lower level representations of the computer program is called \_\_\_\_\_.

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- c) Cross-compiler
- d) All the above

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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONIC SYSTEM DESIGN**

Day & Date: Saturday, 14-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

- Q.2 Attempt any four. 16**
- a) Classify and compare electronics product.
  - b) State and explain features of DSO.
  - c) Compare centralized power architecture and distributed power architecture.
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- Q.3 Attempt any two. 12**
- a) Explain operation of logic analyzer using block diagram.
  - b) Draw and explain instrumentation amplifier.
  - c) Explain different protection circuits of SMPS.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Write short note on software design documentation.
  - b) Discuss different criteria while deciding the module in structured program.
  - c) Explain the humidity testing.
  - d) Write a short note on radiated emission test.
  - e) Differentiate the contents of service manual, engineering diary, and user manual.
- Q.5 Attempt any two. 12**
- a) Write recommended steps in software development of real life processor based product.
  - b) State and explain the importance of the IEC standard. Explain UL certification.
  - c) Explain in detail the user manual for any user product.



- 8) With two-step control, the controller, \_\_\_\_\_.
- i) The controlled variable will tend to oscillate about the set value.
  - ii) The output of the controller is proportional to the error.
- a) Both i and ii are true
  - b) ii is true
  - c) i is true
  - d) Both i and ii are false
- 9) Under what conditions does the gain of a feedback system approximate to  $1/B$ ?
- a) The loop gain  $AB \gg 1$
  - b) The feedback path gain  $B \gg 1$
  - c) The forward path gain  $A \gg 1$
  - d) The loop gain  $AB \ll 1$
- 10) Lithography is used for \_\_\_\_\_.
- a) Forming resist layers on the substrate
  - b) Cutting tool
  - c) Forming electric bonds
  - d) None of the above
- 11) A complete micro-electromechanical system should \_\_\_\_\_.
- a) Detect process and evaluate external signals
  - b) Make decisions based on obtained information
  - c) Convert decisions into corresponding actuator commands
  - d) All of the above
- 12) The advantages of using the relay type output in PLC's is that \_\_\_\_\_.
- a) They allow small currents to switch large currents
  - b) Provides isolation to the PLC from external circuit
  - c) Suitable for both AC and DC switching
  - d) All of the above
- 13) For optical rotary encoders the \_\_\_\_\_ code is preferred over the binary code.
- a) Gray
  - b) ASCII
  - c) BCD
  - d) Excess 3
- 14) Sensors are interfaced with \_\_\_\_\_ card of the PLC.
- a) Memory
  - b) Input
  - c) Output
  - d) Power

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
MECHATRONICS**

Day & Date: Tuesday, 17-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- List down the characteristics of negative feedback system.
  - Explain in detail the structural text programming used for PLC.
  - Draw a ladder diagram to turn an indicator ON after a 5 sec delay and OFF after a 3 sec delay by the switch.
  - Discuss the possible mechatronics design process stages.
  - List down the factors considered for the selection of a PLC.
- Q.3 Attempt any two. 12**
- Derive a mathematical model for PI controller. Discuss Op-Amp based proportional integral controller with necessary circuit diagrams.
  - Draw and discuss the FBD and ladder diagram programming  $f(abc) = \Pi M(1, 2, 4, 7)$ .
  - Develop a ladder diagram model for motor control with two switches (A, B). When either of two, normally open, switches has to be closed for a coil to be energized and operate an actuator.

**Section – II**

- Q.4 Attempt any four. 16**
- What is impurity doping process used in micromachining? Discuss ion implantation doping processes for semiconductors.
  - List down the differences between bulk and surface micromachining.
  - Discuss the working principle of electro-hydraulic actuation system with a neat sketch.
  - List different methods used for motor control. Explain any one in detail.
  - Draw the block diagram of micro-sensor MEMS system and discuss each block in detail.
- Q.5 Attempt any two. 12**
- Discuss in detail surface micromachining fabrication process for MEMS devices with neat diagrams.
  - Draw and discuss a mechatronics system for a pick and place manipulator with neat diagram.
  - With neat diagram discuss any two sensors used for measuring pressure.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONICS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
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 3) Assume suitable data if necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

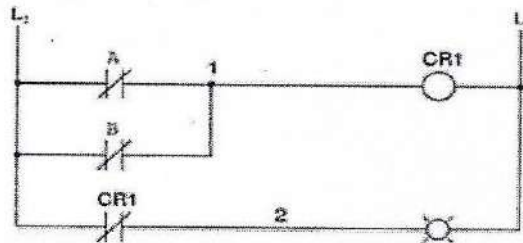
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) With two-step control, the controller, \_\_\_\_\_.
  - i) The controlled variable will tend to oscillate about the set value.
  - ii) The output of the controller is proportional to the error.
  - a) Both i and ii are true
  - b) ii is true
  - c) i is true
  - d) Both i and ii are false
- 2) Under what conditions does the gain of a feedback system approximate to  $1/B$ ?
  - a) The loop gain  $AB \gg 1$
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- 3) Lithography is used for \_\_\_\_\_.
  - a) Forming resist layers on the substrate
  - b) Cutting tool
  - c) Forming electric bonds
  - d) None of the above
- 4) A complete micro-electromechanical system should \_\_\_\_\_.
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- 5) The advantages of using the relay type output in PLC's is that \_\_\_\_\_.
  - a) They allows small currents to switch large currents
  - b) Provides isolation to the PLC from external circuit external circuit
  - c) Suitable for both AC and DC switching
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- 6) For optical rotary encoders the \_\_\_\_\_ code is preferred over the binary code.
  - a) Gray
  - b) ASCII
  - c) BCD
  - d) Excess 3
- 7) Sensors are interfaced with \_\_\_\_\_ card of the PLC.
  - a) Memory
  - b) Input
  - c) Output
  - d) Power

- 8) A control system in which the control action is somehow dependent on the output is known as \_\_\_\_\_.  
 a) Closed loop system                      b) Semi closed loop system  
 c) Open loop system                        d) None of the above
- 9) A counter that starts from a specified number and increments up to maximum count is \_\_\_\_\_.  
 a) Down counter                              b) Cascading counter  
 c) Up counter                                 d) Reset counter
- 10) A sensor, for an input of 12V gives a digital output of a word of 8 bits. Approximately resolution is \_\_\_\_\_.  
 a) 46.88 mV                                  b) 23.43 V  
 c) 93.75 V                                  d) None of the above
- 11) The output of the ladder diagram is for \_\_\_\_\_ gate.



- a) EXOR    b) NOR  
 c) AND    d) NAND
- 12) Which control system does have a stability problem?  
 a) Open loop system                        b) Closed loop system  
 c) Both a and b                                d) None of the above
- 13) The device which provides maximum isolation is \_\_\_\_\_.  
 a) Opto-isolator                              b) Pulse transformer  
 c) Normal transformer                      d) None of the above
- 14) The 1's complement representation of signed number -3 is \_\_\_\_\_.  
 a) 10000010                                b) 00000010  
 c) 11111101                                d) 11111110

Seat No.	
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Set **Q**

**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONICS**

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

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**Section – I**

- Q.2 Attempt any four.** **16**
- List down the characteristics of negative feedback system.
  - Explain in detail the structural text programming used for PLC.
  - Draw a ladder diagram to turn an indicator ON after a 5 sec delay and OFF after a 3 sec delay by the switch.
  - Discuss the possible mechatronics design process stages.
  - List down the factors considered for the selection of a PLC.
- Q.3 Attempt any two.** **12**
- Derive a mathematical model for PI controller. Discuss Op-Amp based proportional integral controller with necessary circuit diagrams.
  - Draw and discuss the FBD and ladder diagram programming  $f(abc) = \Pi M(1, 2, 4, 7)$ .
  - Develop a ladder diagram model for motor control with two switches (A, B). When either of two, normally open, switches has to be closed for a coil to be energized and operate an actuator.

**Section – II**

- Q.4 Attempt any four.** **16**
- What is impurity doping process used in micromachining? Discuss ion implantation doping processes for semiconductors.
  - List down the differences between bulk and surface micromachining.
  - Discuss the working principle of electro-hydraulic actuation system with a neat sketch.
  - List different methods used for motor control. Explain any one in detail.
  - Draw the block diagram of micro-sensor MEMS system and discuss each block in detail.
- Q.5 Attempt any two.** **12**
- Discuss in detail surface micromachining fabrication process for MEMS devices with neat diagrams.
  - Draw and discuss a mechatronics system for a pick and place manipulator with neat diagram.
  - With neat diagram discuss any two sensors used for measuring pressure.



Seat No.	
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Set **R**

**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONICS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

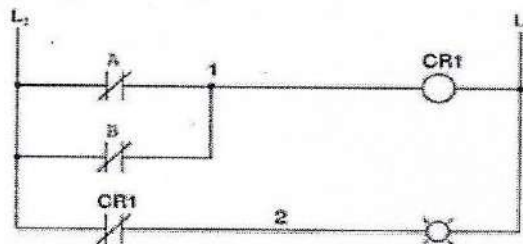
Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Which control system does have a stability problem?
  - a) Open loop system
  - b) Closed loop system
  - c) Both a and b
  - d) None of the above
- 2) The device which provides maximum isolation is \_\_\_\_\_.
  - a) Opto-isolator
  - b) Pulse transformer
  - c) Normal transformer
  - d) None of the above
- 3) The 1's complement representation of signed number -3 is \_\_\_\_\_.
  - a) 10000010
  - b) 00000010
  - c) 11111101
  - d) 11111110
- 4) With two-step control, the controller, \_\_\_\_\_.
  - i) The controlled variable will tend to oscillate about the set value.
  - ii) The output of the controller is proportional to the error.
  - a) Both i and ii are true
  - b) ii is true
  - c) i is true
  - d) Both i and ii are false
- 5) Under what conditions does the gain of a feedback system approximate to  $1/B$ ?
  - a) The loop gain  $AB \gg 1$
  - b) The feedback path gain  $B \gg 1$
  - c) The forward path gain  $A \gg 1$
  - d) The loop gain  $AB \ll 1$
- 6) Lithography is used for \_\_\_\_\_.
  - a) Forming resist layers on the substrate
  - b) Cutting tool
  - c) Forming electric bonds
  - d) None of the above
- 7) A complete micro-electromechanical system should \_\_\_\_\_.
  - a) Detect process and evaluate external signals
  - b) Make decisions based on obtained information
  - c) Convert decisions into corresponding actuator commands
  - d) All of the above

- 8) The advantages of using the relay type output in PLC's is that \_\_\_\_\_.  
 a) They allows small currents to switch large currents  
 b) Provides isolation to the PLC from external circuit external circuit  
 c) Suitable for both AC and DC switching  
 d) All of the above
- 9) For optical rotary encoders the \_\_\_\_\_ code is preferred over the binary code.  
 a) Gray  
 b) ASCII  
 c) BCD  
 d) Excess 3
- 10) Sensors are interfaced with \_\_\_\_\_ card of the PLC.  
 a) Memory  
 b) Input  
 c) Output  
 d) Power
- 11) A control system in which the control action is somehow dependent on the output is known as \_\_\_\_\_.  
 a) Closed loop system  
 b) Semi closed loop system  
 c) Open loop system  
 d) None of the above
- 12) A counter that starts from a specified number and increments up to maximum count is \_\_\_\_\_.  
 a) Down counter  
 b) Cascading counter  
 c) Up counter  
 d) Reset counter
- 13) A sensor, for an input of 12V gives a digital output of a word of 8 bits. Approximately resolution is \_\_\_\_\_.  
 a) 46.88 mV  
 b) 23.43 V  
 c) 93.75 V  
 d) None of the above
- 14) The output of the ladder diagram is for \_\_\_\_\_ gate.



- a) EXOR  
 b) NOR  
 c) AND  
 d) NAND

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
MECHATRONICS**

Day & Date: Tuesday, 17-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- List down the characteristics of negative feedback system.
  - Explain in detail the structural text programming used for PLC.
  - Draw a ladder diagram to turn an indicator ON after a 5 sec delay and OFF after a 3 sec delay by the switch.
  - Discuss the possible mechatronics design process stages.
  - List down the factors considered for the selection of a PLC.
- Q.3 Attempt any two. 12**
- Derive a mathematical model for PI controller. Discuss Op-Amp based proportional integral controller with necessary circuit diagrams.
  - Draw and discuss the FBD and ladder diagram programming  $f(abc) = \Pi M(1, 2, 4, 7)$ .
  - Develop a ladder diagram model for motor control with two switches (A, B). When either of two, normally open, switches has to be closed for a coil to be energized and operate an actuator.

**Section – II**

- Q.4 Attempt any four. 16**
- What is impurity doping process used in micromachining? Discuss ion implantation doping processes for semiconductors.
  - List down the differences between bulk and surface micromachining.
  - Discuss the working principle of electro-hydraulic actuation system with a neat sketch.
  - List different methods used for motor control. Explain any one in detail.
  - Draw the block diagram of micro-sensor MEMS system and discuss each block in detail.
- Q.5 Attempt any two. 12**
- Discuss in detail surface micromachining fabrication process for MEMS devices with neat diagrams.
  - Draw and discuss a mechatronics system for a pick and place manipulator with neat diagram.
  - With neat diagram discuss any two sensors used for measuring pressure.

Seat No.	
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Set **S**

**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONICS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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) Lithography is used for \_\_\_\_\_.
  - a) Forming resist layers on the substrate
  - b) Cutting tool
  - c) Forming electric bonds
  - d) None of the above
- 2) A complete micro-electromechanical system should \_\_\_\_\_.
  - a) Detect process and evaluate external signals
  - b) Make decisions based on obtained information
  - c) Convert decisions into corresponding actuator commands
  - d) All of the above
- 3) The advantages of using the relay type output in PLC's is that \_\_\_\_\_.
  - a) They allows small currents to switch large currents
  - b) Provides isolation to the PLC from external circuit external circuit
  - c) Suitable for both AC and DC switching
  - d) All of the above
- 4) For optical rotary encoders the \_\_\_\_\_ code is preferred over the binary code.
 

a) Gray	b) ASCII
c) BCD	d) Excess 3
- 5) Sensors are interfaced with \_\_\_\_\_ card of the PLC.
 

a) Memory	b) Input
c) Output	d) Power
- 6) A control system in which the control action is somehow dependent on the output is known as \_\_\_\_\_.
 

a) Closed loop system	b) Semi closed loop system
c) Open loop system	d) None of the above
- 7) A counter that starts from a specified number and increments up to maximum count is \_\_\_\_\_.
 

a) Down counter	b) Cascading counter
c) Up counter	d) Reset counter



Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MECHATRONICS**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- List down the characteristics of negative feedback system.
  - Explain in detail the structural text programming used for PLC.
  - Draw a ladder diagram to turn an indicator ON after a 5 sec delay and OFF after a 3 sec delay by the switch.
  - Discuss the possible mechatronics design process stages.
  - List down the factors considered for the selection of a PLC.
- Q.3 Attempt any two. 12**
- Derive a mathematical model for PI controller. Discuss Op-Amp based proportional integral controller with necessary circuit diagrams.
  - Draw and discuss the FBD and ladder diagram programming  $f(abc) = \text{IIM}(1, 2, 4, 7)$ .
  - Develop a ladder diagram model for motor control with two switches (A, B). When either of two, normally open, switches has to be closed for a coil to be energized and operate an actuator.

**Section – II**

- Q.4 Attempt any four. 16**
- What is impurity doping process used in micromachining? Discuss ion implantation doping processes for semiconductors.
  - List down the differences between bulk and surface micromachining.
  - Discuss the working principle of electro-hydraulic actuation system with a neat sketch.
  - List different methods used for motor control. Explain any one in detail.
  - Draw the block diagram of micro-sensor MEMS system and discuss each block in detail.
- Q.5 Attempt any two. 12**
- Discuss in detail surface micromachining fabrication process for MEMS devices with neat diagrams.
  - Draw and discuss a mechatronics system for a pick and place manipulator with neat diagram.
  - With neat diagram discuss any two sensors used for measuring pressure.



- 9) Contrast stretching \_\_\_\_\_ the range of intensity values in an input image.
- a) expands
  - b) decreases
  - c) minimizes
  - d) none of these
- 10) Hough transform can be used to detect \_\_\_\_\_ in an input image.
- a) circles
  - b) straight lines
  - c) curves
  - d) all of these
- 11) Merging and splitting approaches are part of which segmentation method?
- a) edge-based
  - b) region-based
  - c) watershed
  - d) maximizes
- 12) In spatial filtering, masks for correlation and convolution approaches differ by degrees \_\_\_\_\_.
- a) 180
  - b) 120
  - c) 360
  - d) 90
- 13) A digital boundary can be approximated with arbitrary accuracy by a \_\_\_\_\_.
- a) triangle
  - b) square
  - c) polygon
  - d) hexagon
- 14) The *MPEG* standard was developed for \_\_\_\_\_.
- a) grayscale images
  - b) video
  - c) color images
  - d) none of these



Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Answer any four. 16**
- a) Illustrate image sampling and quantization in the context of image processing.
  - b) What is Singular Value Decomposition (SVD)? How SVD can be used to compress digital images?
  - c) Write the resultant transformation (or affine) matrix if an input image has to be upsampled by factor of 2 and rotated by 30 degrees.
  - d) Why do we process images? Distinguish representation of a digital image with its continuous counterpart.
  - e) How many bits do we need to store an image of size  $N \times N$ ? Calculate the same for grayscale and color image of size  $256 \times 256$ .
- Q.3 Answer any two. 12**
- a) What are different color models used in general? For any two color models of your choice, write down the formulae to convert from one color model to another and vice versa.
  - b) What is Principle Component Analysis (PCA)? Explain the steps to obtain PCA for 2-D data.
  - c) What is the histogram of an image? What is histogram equalization?

**Section – II**

- Q.4 Answer any four. 16**
- a) Explain Harris corner detection algorithm.
  - b) Explain predictive image compression approach.
  - c) Why signatures are used in image processing?
  - d) Explain algorithm to obtain skeleton of a binary region.
  - e) Write down the main conceptual differences in edge-based and region-based approaches to image segmentation.
- Q.5 Answer any two 12**
- a) Explain in brief different JPEG still image compression modes.
  - b) Explain JPEG-2000 image compression with schematic diagram.
  - c) Explain region based segmentation along with splitting and merging steps.

Seat No.	
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Set **Q**

**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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) Log transformation \_\_\_\_\_ the dynamic range of intensity values in an input image.
  - a) reduces
  - b) increases
  - c) minimizes
  - d) maximizes
- 2) Contrast stretching \_\_\_\_\_ the range of intensity values in an input image.
  - a) expands
  - b) decreases
  - c) minimizes
  - d) none of these
- 3) Hough transform can be used to detect \_\_\_\_\_ in an input image.
  - a) circles
  - b) straight lines
  - c) curves
  - d) all of these
- 4) Merging and splitting approaches are part of which segmentation method?
  - a) edge-based
  - b) region-based
  - c) watershed
  - d) maximizes
- 5) In spatial filtering, masks for correlation and convolution approaches differ by degrees \_\_\_\_\_.
  - a) 180
  - b) 120
  - c) 360
  - d) 90
- 6) A digital boundary can be approximated with arbitrary accuracy by a \_\_\_\_\_.
  - a) triangle
  - b) square
  - c) polygon
  - d) hexagon
- 7) The *MPEG* standard was developed for \_\_\_\_\_.
  - a) grayscale images
  - b) video
  - c) color images
  - d) none of these
- 8) Digitizing the amplitude values is called \_\_\_\_\_.
  - a) sampling
  - b) quantization
  - c) scaling
  - d) none of these
- 9) The difference in intensity between the highest and lowest intensity levels in an image is called as \_\_\_\_\_.
  - a) noise
  - b) contrast
  - c) dynamic range
  - d) saturation



<b>Seat No.</b>	
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**Set Q**

**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four. 16**

- a) Illustrate image sampling and quantization in the context of image processing.
- b) What is Singular Value Decomposition (SVD)? How SVD can be used to compress digital images?
- c) Write the resultant transformation (or affine) matrix if an input image has to be upsampled by factor of 2 and rotated by 30 degrees.
- d) Why do we process images? Distinguish representation of a digital image with its continuous counterpart.
- e) How many bits do we need to store an image of size  $N \times N$ ? Calculate the same for grayscale and color image of size  $256 \times 256$ .

**Q.3 Answer any two. 12**

- a) What are different color models used in general? For any two color models of your choice, write down the formulae to convert from one color model to another and vice versa.
- b) What is Principle Component Analysis (PCA)? Explain the steps to obtain PCA for 2-D data.
- c) What is the histogram of an image? What is histogram equalization?

**Section – II**

**Q.4 Answer any four. 16**

- a) Explain Harris corner detection algorithm.
- b) Explain predictive image compression approach.
- c) Why signatures are used in image processing?
- d) Explain algorithm to obtain skeleton of a binary region.
- e) Write down the main conceptual differences in edge-based and region-based approaches to image segmentation.

**Q.5 Answer any two 12**

- a) Explain in brief different JPEG still image compression modes.
- b) Explain JPEG-2000 image compression with schematic diagram.
- c) Explain region based segmentation along with splitting and merging steps.

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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) 2-D Discrete Fourier transform provides a way to analyze input image in terms of \_\_\_\_\_.
  - a) spatial information
  - b) frequency information
  - c) both spatial and frequency information
  - d) none of these
- 2) 2-D Discrete cosine transform provides excellent capability for \_\_\_\_\_.
  - a) Image restoration
  - b) Image compression
  - c) Image deconvolution
  - d) Image enhancement
- 3) For rotating the input image by 30 degrees which operation should be used?
  - a) point processing
  - b) neighborhood
  - c) geometric transformation
  - d) image analysis
- 4) Log transformation \_\_\_\_\_ the dynamic range of intensity values in an input image.
  - a) reduces
  - b) increases
  - c) minimizes
  - d) maximizes
- 5) Contrast stretching \_\_\_\_\_ the range of intensity values in an input image.
  - a) expands
  - b) decreases
  - c) minimizes
  - d) none of these
- 6) Hough transform can be used to detect \_\_\_\_\_ in an input image.
  - a) circles
  - b) straight lines
  - c) curves
  - d) all of these
- 7) Merging and splitting approaches are part of which segmentation method?
  - a) edge-based
  - b) region-based
  - c) watershed
  - d) maximizes
- 8) In spatial filtering, masks for correlation and convolution approaches differ by degrees \_\_\_\_\_.
  - a) 180
  - b) 120
  - c) 360
  - d) 90



<b>Seat No.</b>	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four. 16**

- Illustrate image sampling and quantization in the context of image processing.
- What is Singular Value Decomposition (SVD)? How SVD can be used to compress digital images?
- Write the resultant transformation (or affine) matrix if an input image has to be upsampled by factor of 2 and rotated by 30 degrees.
- Why do we process images? Distinguish representation of a digital image with its continuous counterpart.
- How many bits do we need to store an image of size  $N \times N$ ? Calculate the same for grayscale and color image of size  $256 \times 256$ .

**Q.3 Answer any two. 12**

- What are different color models used in general? For any two color models of your choice, write down the formulae to convert from one color model to another and vice versa.
- What is Principle Component Analysis (PCA)? Explain the steps to obtain PCA for 2-D data.
- What is the histogram of an image? What is histogram equalization?

**Section – II**

**Q.4 Answer any four. 16**

- Explain Harris corner detection algorithm.
- Explain predictive image compression approach.
- Why signatures are used in image processing?
- Explain algorithm to obtain skeleton of a binary region.
- Write down the main conceptual differences in edge-based and region-based approaches to image segmentation.

**Q.5 Answer any two 12**

- Explain in brief different JPEG still image compression modes.
- Explain JPEG-2000 image compression with schematic diagram.
- Explain region based segmentation along with splitting and merging steps.

Seat No.	
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Set **S**

**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
 2) 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) Hough transform can be used to detect \_\_\_\_\_ in an input image.
  - a) circles
  - b) straight lines
  - c) curves
  - d) all of these
- 2) Merging and splitting approaches are part of which segmentation method?
  - a) edge-based
  - b) region-based
  - c) watershed
  - d) maximizes
- 3) In spatial filtering, masks for correlation and convolution approaches differ by degrees \_\_\_\_\_.
  - a) 180
  - b) 120
  - c) 360
  - d) 90
- 4) A digital boundary can be approximated with arbitrary accuracy by a \_\_\_\_\_.
  - a) triangle
  - b) square
  - c) polygon
  - d) hexagon
- 5) The *MPEG* standard was developed for \_\_\_\_\_.
  - a) grayscale images
  - b) video
  - c) color images
  - d) none of these
- 6) Digitizing the amplitude values is called \_\_\_\_\_.
  - a) sampling
  - b) quantization
  - c) scaling
  - d) none of these
- 7) The difference in intensity between the highest and lowest intensity levels in an image is called as \_\_\_\_\_.
  - a) noise
  - b) contrast
  - c) dynamic range
  - d) saturation
- 8) The number of bits required to store a digital image of size  $N \times N$  having  $2^k$  intensity levels are \_\_\_\_\_.
  - a)  $Nk$
  - b)  $N/k$
  - c)  $kN^2$
  - d)  $Nk^2$
- 9) Transform domain operations in case of 2-D Discrete Cosine Transform requires \_\_\_\_\_.
  - a) real arithmetic
  - b) complex arithmetic
  - c) binary arithmetic
  - d) none of these



- 10) 2-D Discrete Fourier transform provides a way to analyze input image in terms of \_\_\_\_\_.  
a) spatial information  
b) frequency information  
c) both spatial and frequency information  
d) none of these
- 11) 2-D Discrete cosine transform provides excellent capability for \_\_\_\_\_.  
a) Image restoration  
b) Image compression  
c) Image deconvolution  
d) Image enhancement
- 12) For rotating the input image by 30 degrees which operation should be used?  
a) point processing  
b) neighborhood  
c) geometric transformation  
d) image analysis
- 13) Log transformation \_\_\_\_\_ the dynamic range of intensity values in an input image.  
a) reduces  
b) increases  
c) minimizes  
d) maximizes
- 14) Contrast stretching \_\_\_\_\_ the range of intensity values in an input image.  
a) expands  
b) decreases  
c) minimizes  
d) none of these

Seat No.	
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**B.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**IMAGE PROCESSING**

Day & Date: Tuesday, 17-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

**Q.2 Answer any four. 16**

- Illustrate image sampling and quantization in the context of image processing.
- What is Singular Value Decomposition (SVD)? How SVD can be used to compress digital images?
- Write the resultant transformation (or affine) matrix if an input image has to be upsampled by factor of 2 and rotated by 30 degrees.
- Why do we process images? Distinguish representation of a digital image with its continuous counterpart.
- How many bits do we need to store an image of size  $N \times N$ ? Calculate the same for grayscale and color image of size  $256 \times 256$ .

**Q.3 Answer any two. 12**

- What are different color models used in general? For any two color models of your choice, write down the formulae to convert from one color model to another and vice versa.
- What is Principle Component Analysis (PCA)? Explain the steps to obtain PCA for 2-D data.
- What is the histogram of an image? What is histogram equalization?

**Section – II**

**Q.4 Answer any four. 16**

- Explain Harris corner detection algorithm.
- Explain predictive image compression approach.
- Why signatures are used in image processing?
- Explain algorithm to obtain skeleton of a binary region.
- Write down the main conceptual differences in edge-based and region-based approaches to image segmentation.

**Q.5 Answer any two 12**

- Explain in brief different JPEG still image compression modes.
- Explain JPEG-2000 image compression with schematic diagram.
- Explain region based segmentation along with splitting and merging steps.

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 frequency of oscillation in a backward wave oscillator can be changed by \_\_\_\_\_.
  - a) varying the voltage which controls beam velocity
  - b) varying the beam current
  - c) both by varying the beam current and by light varying the voltage which controls beam velocity
  - d) changing the rate of thermionic emission
- 2) The semiconductor diode which can be used in switching circuit in microwave range is \_\_\_\_\_.
  - a) PIN diode
  - b) Varactor diode
  - c) Tunnel diode
  - d) Gunn diode
- 3) What happens to a tunnel diode when the reverse bias effect goes beyond the valley point?
  - a) it behaves as a normal diode
  - b) it attains increased negative slope effects
  - c) reverse saturation current increases
  - d) becomes independent of temperature
- 4) Which of the following is wrong for a magic used to tee?
  - a) E and H arms are decoupled
  - b) coplanar arms are coupled
  - c) all ports are perfectly matched
  - d) A signal into coplanar arm splits equally between E and H arms
- 5) The two terms used to describe performance of a directional coupler are \_\_\_\_\_.
  - a) coupling and directivity
  - b) gain and coupling
  - c) gain and directivity
  - d) gain and isolation
- 6) The duty cycle of a radar transmitter is equal to \_\_\_\_\_.
  - a) (PRF) (pulse width)
  - b) (PRF)/(pulse width)
  - c) (pulse width) /(PRF)
  - d) (pulse width) + (PRF)
- 7) Which of the following diode is used as a detector in a RADAR?
  - a) Gunn Diode
  - b) Schottky diode
  - c) IMPATT diode
  - d) Any of the above

- 8) Antenna elevation angle at the ground station for satellite communication is always kept above  $5^\circ$  to \_\_\_\_\_.
- a) minimize the sky noise temperature
  - b) reduce the effect of oxygen and water vapors absorption on the antenna noise temperature
  - c) minimize the slant range
  - d) increase the visibility of the satellite
- 9) FM is preferred for satellite communication because \_\_\_\_\_.
- a) satellite channel has large bandwidth and less noise
  - b) It gives high modulation index
  - c) low bandwidth is essentially required
  - d) Other methods of modulation will result in fading and distortion
- 10) A geostationary satellite \_\_\_\_\_.
- a) remains stationary in space.
  - b) remains at a height of 1000 km above the surface of earth.
  - c) orbits the earth with 24 hour period.
  - d) remains always in a direction opposite to that of sun, with respect to earth.
- 11) Satellite communication links are preferred over sub-marine cables because \_\_\_\_\_.
- a) they are faster
  - b) they involve lesser cost
  - c) of their multiple access ability
  - d) none of these
- 12) What does a link budget for satellite communication include?
- a) Total cost of satellite
  - b) Cost of satellite plus launch vehicle
  - c) Signal and noise levels in dB
  - d) Margins of error permitted
- 13) The output stage of a transponder on-board a satellite has a maximum power output of 10 watts. However, it is not operated at the maximum power output in order to \_\_\_\_\_.
- a) Conserve the available limited battery power
  - b) Reduce noise due to device
  - c) Avoid inter-modulation distortion
  - d) Avoid heating up of the satellite beyond a preset value
- 14) Is the width of the range of wavelengths emitted by the light source \_\_\_\_\_.
- a) Bandwidth
  - b) Chromatic Dispersion
  - c) Spectral width
  - d) Beamwidth

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt Any Two.** **12**
- a) Realize construction and working of TWT. State its performance parameters.
  - b) Draw block diagram of Pulse radar system and explain its working Principal.
  - c) Dramatize construction and working two hole directional coupler. Derive its S- matrix.
- Q.3 Attempt Any Four.** **16**
- a) With suitable Diagram explain working of Circulator.
  - b) Compare E-plane Tee Junction and H-plane Tee Junction.
  - c) With the waveform show how BARATT diode functions in negative resistance region.
  - d) Derive Doppler frequency in continuous wave radar.
  - e) Show how PIN diode can be used as variable resistance and variable capacitance.

**Section – II**

- Q.4 Attempt Any Two.** **12**
- a) Realize block diagram of Telemetry Tracking and control subsystem and explain.
  - b) Explain construction and working of LASER diode.
  - c) "Satellite can be used in Navigation Service like Globe positioning system" illustrate the statement.
- Q.5 Attempt Any Four.** **16**
- a) Summarize basic antenna types used for satellite.
  - b) Discuss on multiple accesses in satellite.
  - c) Outline different losses in optical fiber.
  - d) State Kepler's Three Laws of planetary motion.
  - e) State range and application of LEO, MEO and GEO satellites.

<b>Seat No.</b>	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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) Antenna elevation angle at the ground station for satellite communication is always kept above  $5^\circ$  to \_\_\_\_\_.
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c) of their multiple access ability	d) none of these
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  - d) Gunn diode
- 10) What happens to a tunnel diode when the reverse bias effect goes beyond the valley point?
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  - c) reverse saturation current increases
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  - b) gain and coupling
  - c) gain and directivity
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- 13) The duty cycle of a radar transmitter is equal to \_\_\_\_\_.
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  - b) Schottky diode
  - c) IMPATT diode
  - d) Any of the above

Seat No.	
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Set **Q**

**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 56

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

- Q.2 Attempt Any Two.** **12**
- a) Realize construction and working of TWT. State its performance parameters.
  - b) Draw block diagram of Pulse radar system and explain its working Principal.
  - c) Dramatize construction and working two hole directional coupler. Derive its S- matrix.
- Q.3 Attempt Any Four.** **16**
- a) With suitable Diagram explain working of Circulator.
  - b) Compare E-plane Tee Junction and H-plane Tee Junction.
  - c) With the waveform show how BARATT diode functions in negative resistance region.
  - d) Derive Doppler frequency in continuous wave radar.
  - e) Show how PIN diode can be used as variable resistance and variable capacitance.

**Section – II**

- Q.4 Attempt Any Two.** **12**
- a) Realize block diagram of Telemetry Tracking and control subsystem and explain.
  - b) Explain construction and working of LASER diode.
  - c) "Satellite can be used in Navigation Service like Globe positioning system" illustrate the statement.
- Q.5 Attempt Any Four.** **16**
- a) Summarize basic antenna types used for satellite.
  - b) Discuss on multiple accesses in satellite.
  - c) Outline different losses in optical fiber.
  - d) State Kepler's Three Laws of planetary motion.
  - e) State range and application of LEO, MEO and GEO satellites.



Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 two terms used to describe performance of a directional coupler are \_\_\_\_\_.  
 a) coupling and directivity                      b) gain and coupling  
 c) gain and directivity                            d) gain and isolation
- 2) The duty cycle of a radar transmitter is equal to \_\_\_\_\_.  
 a) (PRF) (pulse width)                            b) (PRF)/(pulse width)  
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
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- a) Realize construction and working of TWT. State its performance parameters.
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- a) With suitable Diagram explain working of Circulator.
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  - c) With the waveform show how BARATT diode functions in negative resistance region.
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**Section – II**

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  - d) State Kepler's Three Laws of planetary motion.
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<b>Seat No.</b>	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

Day & Date: Friday, 22-11-2019  
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Max. Marks: 70

- 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 geostationary satellite \_\_\_\_\_.
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  - c) Signal and noise levels in dB
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  - a) Conserve the available limited battery power
  - b) Reduce noise due to device
  - c) Avoid inter-modulation distortion
  - d) Avoid heating up of the satellite beyond a preset value
  
- 5) Is the width of the range of wavelengths emitted by the light source \_\_\_\_\_.
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  - c) Spectral width
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- 6) The frequency of oscillation in a backward wave oscillator can be changed by \_\_\_\_\_.
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- it behaves as a normal diode
  - it attains increased negative slope effects
  - reverse saturation current increases
  - becomes independent of temperature
- 9) Which of the following is wrong for a magic tee?
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  - coplanar arms are coupled
  - all ports are perfectly matched
  - A signal into coplanar arm splits equally between E and H arms
- 10) The two terms used to describe performance of a directional coupler are \_\_\_\_\_.
- coupling and directivity
  - gain and coupling
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- 13) Antenna elevation angle at the ground station for satellite communication is always kept above  $5^\circ$  to \_\_\_\_\_.
- minimize the sky noise temperature
  - reduce the effect of oxygen and water vapors absorption on the antenna noise temperature
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- satellite channel has large bandwidth and less noise
  - It gives high modulation index
  - low bandwidth is essentially required
  - Other methods of modulation will result in fading and distortion

Seat No.	
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Set **S**

**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ADVANCED COMMUNICATION ENGINEERING**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt Any Two.** **12**
- a) Realize construction and working of TWT. State its performance parameters.
  - b) Draw block diagram of Pulse radar system and explain its working Principal.
  - c) Dramatize construction and working two hole directional coupler. Derive its S- matrix.
- Q.3 Attempt Any Four.** **16**
- a) With suitable Diagram explain working of Circulator.
  - b) Compare E-plane Tee Junction and H-plane Tee Junction.
  - c) With the waveform show how BARATT diode functions in negative resistance region.
  - d) Derive Doppler frequency in continuous wave radar.
  - e) Show how PIN diode can be used as variable resistance and variable capacitance.

**Section – II**

- Q.4 Attempt Any Two.** **12**
- a) Realize block diagram of Telemetry Tracking and control subsystem and explain.
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  - c) "Satellite can be used in Navigation Service like Globe positioning system" illustrate the statement.
- Q.5 Attempt Any Four.** **16**
- a) Summarize basic antenna types used for satellite.
  - b) Discuss on multiple accesses in satellite.
  - c) Outline different losses in optical fiber.
  - d) State Kepler's Three Laws of planetary motion.
  - e) State range and application of LEO, MEO and GEO satellites.

Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUDIO VIDEO SYSTEM**

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

Max. Marks: 70

**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) Paint programs and image editors are used for creating and editing, \_\_\_\_\_.
  - a) Text
  - b) Vector images
  - c) Bitmap images
  - d) HTML codes
- 2) In video compression, an independent frame that is not related to any other frame is called, \_\_\_\_\_.
  - a) B-Frame
  - b) C-Frame
  - c) I-Frame
  - d) P-Frame
- 3) A video consists of a sequence of, \_\_\_\_\_.
  - a) Frames
  - b) Signals
  - c) Packets
  - d) Slots
- 4) The signals U and V are, \_\_\_\_\_.
  - a) Same as I and Q
  - b) Modified I and Q
  - c) Same as colour difference components R-Y and B-Y
  - d) None of the above
- 5) Compared to progressive scanning, the interlacing technique reduces bandwidth because, \_\_\_\_\_.
  - a) The picture scanning rate is increased
  - b) The picture scanning rate is reduced
  - c) The effective picture scanning rate is kept same while pixel scanning rate is halved
  - d) b) and c) both
- 6) In Audio and Video Compression, voice is sampled at 8000 samples per second with \_\_\_\_\_.
  - a) 5 bits per sample
  - b) 6 bits per sample
  - c) 7 bits per sample
  - d) 8 bits per sample
- 7) For speech, we need to compress the digitize signals at, \_\_\_\_\_.
  - a) 128 KHz
  - b) 256 KHz
  - c) 64 KHz
  - d) 1152 KHz
- 8) The principle of image orthicon camera tube is based on the principle of \_\_\_\_\_.
  - a) Photo-emissivity
  - b) Photo-resistivity
  - c) Photo-conductivity
  - d) None of these

- 9) Delay line matrix is used in PAL receiver, \_\_\_\_\_.
- a) To derive R, G and B colours
  - b) To separate the colour difference components
  - c) Cancel the phase errors
  - d) b) and c)
- 10) The colour subcarrier oscillator frequency of NTSC receiver is \_\_\_\_\_ ,
- a) 5.579545 MHz
  - b) 3.579545 MHz
  - c) 4.579545 MHz
  - d) 2.579545 MHz
- 11) Hue complementary to magenta is, \_\_\_\_\_.
- a) Yellow
  - b) Blue
  - c) Cyan
  - d) Green
- 12) The type of AGC used in TV receiver is, \_\_\_\_\_.
- a) Simple AGC
  - b) Delayed AGC
  - c) Keyed AGC
  - d) b) and c) both
- 13) Slotted aperture mask is used in, \_\_\_\_\_.
- a) Trinitron
  - b) PIL tubes
  - c) Shadow mask tube
  - d) a) and b)
- 14) The process of bringing beam together in picture tube is known as, \_\_\_\_\_.
- a) Convergence
  - b) Purity
  - c) Degaussing
  - d) Pincushion



Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUDIO VIDEO SYSTEM**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory  
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**Section I**

- Q.2 Attempt any four of the following questions. 16**
- a) Discuss the benefits offered by compression schemes in designing multimedia systems?
  - b) Discuss the terms acoustics, reverberation, absorption coefficient, growth and decay of sound?
  - c) Discuss in detail the term MIDI?
  - d) Explain lossy sequential DCT mode of JPEG?
  - e) Compare headphones and headset.
- Q.3 Attempt any two of the following questions. 12**
- a) How sound is optically recorded on photographic film using variable density method?
  - b) Illustrate with a neat block diagram the Facsimile system?
  - c) Illustrate with a neat diagram the different layers of MPEG?

**Section –II**

- Q.4 Attempt any four of the following questions. 16**
- a) Compare NTSC and PAL colour television standards.
  - b) Describe in detail how chrominance signal is derived from RGB signal in PAL TV system?
  - c) Give significance of chromaticity diagram.
  - d) Discuss the term AGC? What are different types of AGC?
  - e) Discuss how interlaced scanning reduces flicker and conserves bandwidth.
- Q.5 Attempt any two of the following questions. 12**
- a) Discuss with a neat diagram three colour theory?
  - b) Draw block diagram of digital TV and explain its working in detail?
  - c) Explain Trinitron picture tube?



- 10) A video consists of a sequence of, \_\_\_\_\_.
- a) Frames
  - b) Signals
  - c) Packets
  - d) Slots
- 11) The signals U and V are, \_\_\_\_\_.
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- a) Compare NTSC and PAL colour television standards.
  - b) Describe in detail how chrominance signal is derived from RGB signal in PAL TV system?
  - c) Give significance of chromaticity diagram.
  - d) Discuss the term AGC? What are different types of AGC?
  - e) Discuss how interlaced scanning reduces flicker and conserves bandwidth.
- Q.5 Attempt any two of the following questions. 12**
- a) Discuss with a neat diagram three colour theory?
  - b) Draw block diagram of digital TV and explain its working in detail?
  - c) Explain Trinitron picture tube?

Seat  
No.

**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUDIO VIDEO SYSTEM**

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

Max. Marks: 70

- 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) Compared to progressive scanning, the interlacing technique reduces bandwidth because, \_\_\_\_\_.
  - a) The picture scanning rate is increased
  - b) The picture scanning rate is reduced
  - c) The effective picture scanning rate is kept same while pixel scanning rate is halved
  - d) b) and c) both
- 2) In Audio and Video Compression, voice is sampled at 8000 samples per second with \_\_\_\_\_.
  - a) 5 bits per sample
  - b) 6 bits per sample
  - c) 7 bits per sample
  - d) 8 bits per sample
- 3) For speech, we need to compress the digitize signals at, \_\_\_\_\_.
  - a) 128 KHz
  - b) 256 KHz
  - c) 64 KHz
  - d) 1152 KHz
- 4) The principle of image orthicon camera tube is based on the principle of \_\_\_\_\_.
  - a) Photo-emissivity
  - b) Photo-resistivity
  - c) Photo-conductivity
  - d) None of these
- 5) Delay line matrix is used in PAL receiver, \_\_\_\_\_.
  - a) To derive R, G and B colours
  - b) To separate the colour difference components
  - c) Cancel the phase errors
  - d) b) and c)
- 6) The colour subcarrier oscillator frequency of NTSC receiver is \_\_\_\_\_,
  - a) 5.579545 MHz
  - b) 3.579545 MHz
  - c) 4.579545 MHz
  - d) 2.579545 MHz
- 7) Hue complementary to magenta is, \_\_\_\_\_.
  - a) Yellow
  - b) Blue
  - c) Cyan
  - d) Green
- 8) The type of AGC used in TV receiver is, \_\_\_\_\_.
  - a) Simple AGC
  - b) Delayed AGC
  - c) Keyed AGC
  - d) b) and c) both



Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUDIO VIDEO SYSTEM**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section I**

- Q.2 Attempt any four of the following questions. 16**
- a) Discuss the benefits offered by compression schemes in designing multimedia systems?
  - b) Discuss the terms acoustics, reverberation, absorption coefficient, growth and decay of sound?
  - c) Discuss in detail the term MIDI?
  - d) Explain lossy sequential DCT mode of JPEG?
  - e) Compare headphones and headset.
- Q.3 Attempt any two of the following questions. 12**
- a) How sound is optically recorded on photographic film using variable density method?
  - b) Illustrate with a neat block diagram the Facsimile system?
  - c) Illustrate with a neat diagram the different layers of MPEG?

**Section –II**

- Q.4 Attempt any four of the following questions. 16**
- a) Compare NTSC and PAL colour television standards.
  - b) Describe in detail how chrominance signal is derived from RGB signal in PAL TV system?
  - c) Give significance of chromaticity diagram.
  - d) Discuss the term AGC? What are different types of AGC?
  - e) Discuss how interlaced scanning reduces flicker and conserves bandwidth.
- Q.5 Attempt any two of the following questions. 12**
- a) Discuss with a neat diagram three colour theory?
  - b) Draw block diagram of digital TV and explain its working in detail?
  - c) Explain Trinitron picture tube?





- 10) Compared to progressive scanning, the interlacing technique reduces bandwidth because, \_\_\_\_\_.
- a) The picture scanning rate is increased
  - b) The picture scanning rate is reduced
  - c) The effective picture scanning rate is kept same while pixel scanning rate is halved
  - d) b) and c) both
- 11) In Audio and Video Compression, voice is sampled at 8000 samples per second with \_\_\_\_\_.
- a) 5 bits per sample
  - b) 6 bits per sample
  - c) 7 bits per sample
  - d) 8 bits per sample
- 12) For speech, we need to compress the digitize signals at, \_\_\_\_\_.
- a) 128 KHz
  - b) 256 KHz
  - c) 64 KHz
  - d) 1152 KHz
- 13) The principle of image orthicon camera tube is based on the principle of \_\_\_\_\_.
- a) Photo-emissivity
  - b) Photo-resistivity
  - c) Photo-conductivity
  - d) None of these
- 14) Delay line matrix is used in PAL receiver, \_\_\_\_\_.
- a) To derive R, G and B colours
  - b) To separate the colour difference components
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  - d) b) and c)

Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**AUDIO VIDEO SYSTEM**

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

Max. Marks: 56

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**Section I**

- Q.2 Attempt any four of the following questions. 16**
- a) Discuss the benefits offered by compression schemes in designing multimedia systems?
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**Section –II**

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  - c) Give significance of chromaticity diagram.
  - d) Discuss the term AGC? What are different types of AGC?
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  - c) Explain Trinitron picture tube?

Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data 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) After the execution of following ARM instruction the content of R2 register will be \_\_\_\_\_ RSB R2, R2, R2, LSL #3.
 

a) R2 * 7	b) R2 / 7
c) R2 * 8	d) R2 / 8
- 2) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P1.25 to P1.30
 

a) PINSEL2	b) IODIR2
c) PINSEL0	d) PINSEL1
- 3) The on-chip ADC's of LPC2148 has \_\_\_\_\_ bit resolution and \_\_\_\_\_ conversion time.
 

a) 8, 2.44 μsec	b) 10, 2.44 μsec
c) 12, 1.44 μsec	d) 10, 1.44μsec
- 4) To force logic '0' on port pin P1 .20, \_\_\_\_\_ register is used in LPC2148.
 

a) IOSET0	b) IOCLR0
c) IOCLR1	d) IODIR3
- 5) What is the value of R1 after MVN R1, #3 is executed?
 

a) 0x00000003	b) 0xFFFFFFFFC
c) 0xFFFFFFFFE	d) 0xFFFFFFFFD
- 6) \_\_\_\_\_ vector is used when the processor cannot decode an instruction.
 

a) Undefined	b) Abort
c) Reset	d) Data Abort
- 7) Let R0=0x00000000 and R1=0x00000055. What will be the content of R0 after execution of "ADD R0, R1, R1, LSL #1"?
 

a) 0x00000000	b) 0x00000005
c) 0x000000FF	d) 0x0000000A
- 8) The most common methods to obtain exclusive access to shared resources is/are \_\_\_\_\_.
 

a) Disabling interrupts	b) Disabling scheduling
c) Using semaphores	d) All of above
- 9) In \_\_\_\_\_ kernel, the highest priority task ready to run is always given control of the CPU.
 

a) Non-preemptive	b) Preemptive
c) Micro	d) None of the above

- 10) The \_\_\_\_\_ is the part of the kernel responsible for determining which task will run next.
- a) Scheduler
  - b) Semaphore
  - c) Mailbox
  - d) Mutex
- 11) A \_\_\_\_\_ is a situation in which two tasks are each unknowingly waiting for resources held by each other.
- a) Deadlock
  - b) Synchronization
  - c) Dormant
  - d) No of the above.
- 12) A semaphore is/are used to \_\_\_\_\_.
- a) control access to a shared resource
  - b) signal the occurrence of an event
  - c) allow two tasks to synchronize their activities
  - d) all of the above.
- 13) The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
- a) Ready
  - b) Dormant
  - c) Running
  - d) Waiting
- 14)  $\mu$ cos-II and most commercial real-time kernels are \_\_\_\_\_ because system responsiveness is important.
- a) Preemptive
  - b) Non-preemptive
  - c) Selective preemption
  - d) None of above

Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any four** **16**
- a) Write an ARM ASM code to count positive numbers from a series of 16 bit numbers.
  - b) Discuss ADD and RSB data processing ARM instructions with examples.
  - c) Interface one LED to LPC2148 port pin P0.29. Write an embedded C program to blink it continuously.
  - d) What is an exception? Explain vector addresses and vector table.
  - e) List the registers available in Pin Connect block of LPC2148 and discuss any two registers with example.
- Q.3 Attempt any two** **12**
- a) What is pipeline? Explain the effect of pipeline on program execution.
  - b) What do you understand by load/store architecture? Explain load/store instructions in detail with examples.
  - c) Interface a stepper motor with LPC2148 port pins P0.14, P0.15, P0.16, and P0.17 and write an embedded C program to rotate motor in anti-clockwise direction.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) List down all the  $\mu$ cos-II RTOS features.
  - b) What is priority inversion? How to avoid it using priority inheritance?
  - c) Discuss the operation and significance of the  $\mu$ cos-II API functions, OSStart() & OSInit().
  - d) What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
  - e) Explain clock tick in multitasking system. What are the constraints in selection of the clock tick in multitasking system?
- Q.5 Attempt any two** **12**
- a) Elaborate with examples inter-task communication tool, message mailbox, used in RTOS environment.
  - b) Define a task? Discuss the task control box (TCB) and its data in detail.
  - c) Write an embedded C program to illustrate message semaphores in  $\mu$ cos-II for LPC2148.

Seat  
No.

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

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data 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 most common methods to obtain exclusive access to shared resources is/are \_\_\_\_\_.
  - a) Disabling interrupts
  - b) Disabling scheduling
  - c) Using semaphores
  - d) All of above
- 2) In \_\_\_\_\_ kernel, the highest priority task ready to run is always given control of the CPU.
  - a) Non-preemptive
  - b) Preemptive
  - c) Micro
  - d) None of the above
- 3) The \_\_\_\_\_ is the part of the kernel responsible for determining which task will run next.
  - a) Scheduler
  - b) Semaphore
  - c) Mailbox
  - d) Mutex
- 4) A \_\_\_\_\_ is a situation in which two tasks are each unknowingly waiting for resources held by each other.
  - a) Deadlock
  - b) Synchronization
  - c) Dormant
  - d) No of the above.
- 5) A semaphore is/are used to \_\_\_\_\_.
  - a) control access to a shared resource
  - b) signal the occurrence of an event
  - c) allow two tasks to synchronize their activities
  - d) all of the above.
- 6) The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
  - a) Ready
  - b) Dormant
  - c) Running
  - d) Waiting
- 7)  $\mu$ cos-II and most commercial real-time kernels are \_\_\_\_\_ because system responsiveness is important.
  - a) Preemptive
  - b) Non-preemptive
  - c) Selective preemption
  - d) None of above
- 8) After the execution of following ARM instruction the content of R2 register will be \_\_\_\_\_ RSB R2, R2, R2, LSL #3.
  - a)  $R2 * 7$
  - b)  $R2 / 7$
  - c)  $R2 * 8$
  - d)  $R2 / 8$



Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 56

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

**Section – I**

- Q.2 Attempt any four** **16**
- a) Write an ARM ASM code to count positive numbers from a series of 16 bit numbers.
  - b) Discuss ADD and RSB data processing ARM instructions with examples.
  - c) Interface one LED to LPC2148 port pin P0.29. Write an embedded C program to blink it continuously.
  - d) What is an exception? Explain vector addresses and vector table.
  - e) List the registers available in Pin Connect block of LPC2148 and discuss any two registers with example.
- Q.3 Attempt any two** **12**
- a) What is pipeline? Explain the effect of pipeline on program execution.
  - b) What do you understand by load/store architecture? Explain load/store instructions in detail with examples.
  - c) Interface a stepper motor with LPC2148 port pins P0.14, P0.15, P0.16, and P0.17 and write an embedded C program to rotate motor in anti-clockwise direction.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) List down all the  $\mu$ cos-II RTOS features.
  - b) What is priority inversion? How to avoid it using priority inheritance?
  - c) Discuss the operation and significance of the  $\mu$ cos-II API functions, OSStart() & OSInit().
  - d) What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
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- Q.5 Attempt any two** **12**
- a) Elaborate with examples inter-task communication tool, message mailbox, used in RTOS environment.
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Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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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 value of R1 after MVN R1, #3 is executed?
  - a) 0x00000003
  - b) 0xFFFFFFFFC
  - c) 0xFFFFFFFFE
  - d) 0xFFFFFFFFD
- 2) \_\_\_\_\_ vector is used when the processor cannot decode an instruction.
  - a) Undefined
  - b) Abort
  - c) Reset
  - d) Data Abort
- 3) Let R0=0x00000000 and R1=0x00000055. What will be the content of R0 after execution of "ADD R0, R1, R1, LSL #1"?
  - a) 0x00000000
  - b) 0x00000005
  - c) 0x000000FF
  - d) 0x0000000A
- 4) The most common methods to obtain exclusive access to shared resources is/are \_\_\_\_\_.
  - a) Disabling interrupts
  - b) Disabling scheduling
  - c) Using semaphores
  - d) All of above
- 5) In \_\_\_\_\_ kernel, the highest priority task ready to run is always given control of the CPU.
  - a) Non-preemptive
  - b) Preemptive
  - c) Micro
  - d) None of the above
- 6) The \_\_\_\_\_ is the part of the kernel responsible for determining which task will run next.
  - a) Scheduler
  - b) Semaphore
  - c) Mailbox
  - d) Mutex
- 7) A \_\_\_\_\_ is a situation in which two tasks are each unknowingly waiting for resources held by each other.
  - a) Deadlock
  - b) Synchronization
  - c) Dormant
  - d) No of the above.
- 8) A semaphore is/are used to \_\_\_\_\_.
  - a) control access to a shared resource
  - b) signal the occurrence of an event
  - c) allow two tasks to synchronize their activities
  - d) all of the above.

- 9) The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
- |            |            |
|------------|------------|
| a) Ready   | b) Dormant |
| c) Running | d) Waiting |
- 10)  $\mu$ cos-II and most commercial real-time kernels are \_\_\_\_\_ because system responsiveness is important.
- |                         |                   |
|-------------------------|-------------------|
| a) Preemptive           | b) Non-preemptive |
| c) Selective preemption | d) None of above  |
- 11) After the execution of following ARM instruction the content of R2 register will be \_\_\_\_\_ RSB R2, R2, R2, LSL #3.
- |             |             |
|-------------|-------------|
| a) $R2 * 7$ | b) $R2 / 7$ |
| c) $R2 * 8$ | d) $R2 / 8$ |
- 12) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P1.25 to P1.30
- |            |            |
|------------|------------|
| a) PINSEL2 | b) IODIR2  |
| c) PINSEL0 | d) PINSEL1 |
- 13) The on-chip ADC's of LPC2148 has \_\_\_\_\_ bit resolution and \_\_\_\_\_ conversion time.
- |                       |                       |
|-----------------------|-----------------------|
| a) 8, 2.44 $\mu$ sec  | b) 10, 2.44 $\mu$ sec |
| c) 12, 1.44 $\mu$ sec | d) 10, 1.44 $\mu$ sec |
- 14) To force logic '0' on port pin P1 .20, \_\_\_\_\_ register is used in LPC2148.
- |           |           |
|-----------|-----------|
| a) IOSET0 | b) IOCLR0 |
| c) IOCLR1 | d) IODIR3 |

<b>Seat No.</b>	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 56

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

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

- a) Write an ARM ASM code to count positive numbers from a series of 16 bit numbers.
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- a) What is pipeline? Explain the effect of pipeline on program execution.
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**Section – II**

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

- a) List down all the  $\mu$ cos-II RTOS features.
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Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 70

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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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  - c) Mailbox
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- 2) A \_\_\_\_\_ is a situation in which two tasks are each unknowingly waiting for resources held by each other.
  - a) Deadlock
  - b) Synchronization
  - c) Dormant
  - d) No of the above.
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  - b) signal the occurrence of an event
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  - d) all of the above.
- 4) The \_\_\_\_\_ state corresponds to a task which resides in memory but has not been made available to the multitasking kernel.
  - a) Ready
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  - c) Running
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- 5)  $\mu$ cos-II and most commercial real-time kernels are \_\_\_\_\_ because system responsiveness is important.
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  - c)  $R2 * 8$
  - d)  $R2 / 8$
- 7) In LPC2148 \_\_\_\_\_ pin select register is used to configure port pins P1.25 to P1.30
  - a) PINSEL2
  - b) IODIR2
  - c) PINSEL0
  - d) PINSEL1
- 8) The on-chip ADC's of LPC2148 has \_\_\_\_\_ bit resolution and \_\_\_\_\_ conversion time.
  - a) 8, 2.44  $\mu$ sec
  - b) 10, 2.44  $\mu$ sec
  - c) 12, 1.44  $\mu$ sec
  - d) 10, 1.44  $\mu$ sec



Seat No.	
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**B.E. (Part - II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**EMBEDDED SYSTEMS**

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

Max. Marks: 56

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

- Q.2 Attempt any four** **16**
- a) Write an ARM ASM code to count positive numbers from a series of 16 bit numbers.
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  - d) What is an exception? Explain vector addresses and vector table.
  - e) List the registers available in Pin Connect block of LPC2148 and discuss any two registers with example.
- Q.3 Attempt any two** **12**
- a) What is pipeline? Explain the effect of pipeline on program execution.
  - b) What do you understand by load/store architecture? Explain load/store instructions in detail with examples.
  - c) Interface a stepper motor with LPC2148 port pins P0.14, P0.15, P0.16, and P0.17 and write an embedded C program to rotate motor in anti-clockwise direction.

**Section – II**

- Q.4 Attempt any four.** **16**
- a) List down all the  $\mu$ cos-II RTOS features.
  - b) What is priority inversion? How to avoid it using priority inheritance?
  - c) Discuss the operation and significance of the  $\mu$ cos-II API functions, OSStart() & OSInit().
  - d) What is non-preemptive kernel? Elaborate in detail with example and proper diagram.
  - e) Explain clock tick in multitasking system. What are the constraints in selection of the clock tick in multitasking system?
- Q.5 Attempt any two** **12**
- a) Elaborate with examples inter-task communication tool, message mailbox, used in RTOS environment.
  - b) Define a task? Discuss the task control box (TCB) and its data in detail.
  - c) Write an embedded C program to illustrate message semaphores in  $\mu$ cos-II for LPC2148.

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**BROADBAND COMMUNICATION**

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

Max. Marks: 70

- 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) ATM stands for \_\_\_\_\_.  
 a) Automatic teller machine                      b) Automated teller machine  
 c) Automatic transfer machine                  d) Asynchronous transfer mode
- 2) \_\_\_\_\_ are the algorithms are available to update contents of routing tables.  
 a) Distance-Vector Protocol                      b) Link-State Protocol  
 c) Both a & b    d) None of these
- 3) X.25 provides a virtual high-quality digital network at \_\_\_\_\_.  
 a) Low cost    b) High cost  
 c) Medium cost                                        d) All of these
- 4) Cell relay is data transmission services that uses transmission technology referred to as \_\_\_\_\_.  
 a) ATM    b) BTM  
 c) STM    d) DTM
- 5) The data transmission is a fixed length of data known as \_\_\_\_\_.  
 a) Cell    b) Frame  
 c) Relay    d) Cell relay
- 6) VP is a bundle of \_\_\_\_\_.  
 a) VCs    b) VCM  
 c) VCI    d) VIP
- 7) ATM networks are used to carry \_\_\_\_\_ information mostly.  
 a) Voice    b) Video  
 c) Data    d) All of these
- 8) ISDN stands for \_\_\_\_\_.  
 a) Integrated Services Digital Network  
 b) Integrated Services Discrete Network  
 c) Integrated Services Digital Node  
 d) Integrated Services Discrete Node
- 9) ISDN is based on the concept of \_\_\_\_\_.  
 a) SS7    b) CCS  
 c) ARDIS    d) CDPD





Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**BROADBAND COMMUNICATION**

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

Max. Marks: 56

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

- Q.2 Attempt any four. 16**
- a) What are different routing methods and control signals used in circuit switched networks?
  - b) What are X.25 Devices and Protocol Operation?
  - c) Specify frame relay devices. What are switched VC and permanent VC related to frame relay? What is DLCI and specify its importance.
  - d) What are benefits of ATM? What is ATM network interface? How ATM device is connected to ATM network?
  - e) Discuss call establishment procedure in ATM.
- Q.3 Attempt any two. 12**
- a) Draw ATM cell format and describe it in detail.
  - b) Draw LAPF core protocol and discuss in detail.
  - c) Explain PCR algorithm related to ATM.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Why buffers are requirement in ATM switches? How buffer placement is plays important role in case of high speed communication?
  - b) How many channels are there in ISDN over which data communication is possible? Explain multi framing environment in ISDN.
  - c) List different channels available for data transfer in case of ISDN. Explain various channel structures in ISDN.
  - d) What is contention in ISDN? How contention is resolved on D-Channel in ISDN?
  - e) Discuss IEEE 802.16 MAC sublayer and discuss services related to IEEE 802.16.
- Q.5 Attempt any two. 12**
- a) What is rate adaption in ISDN? Explain different rate adaption methods.
  - b) Discuss AODV protocol related to MANET.
  - c) What are ISDN compatible and ISDN incompatible devices? Draw UNI architecture for ISDN and explain in detail.

<b>Seat No.</b>	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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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) ISDN stands for \_\_\_\_\_.  
 a) Integrated Services Digital Network  
 b) Integrated Services Discrete Network  
 c) Integrated Services Digital Node  
 d) Integrated Services Discrete Node
- 2) ISDN is based on the concept of \_\_\_\_\_.  
 a) SS7  
 b) CCS  
 c) ARDIS  
 d) CDPD
- 3) In SONET, duration of any frame is \_\_\_\_\_micro seconds.  
 a) 110?  
 b) 120?  
 c) 125?  
 d) 135?
- 4) Two broad categories of congestion control are \_\_\_\_\_.  
 a) Open-loop and Closed-loop  
 b) Open-control and Closed-control  
 c) Active control and Passive control  
 d) None of the mentioned
- 5) What is the routing algorithm used in MANETs?  
 a) Shortest Path First  
 b) Routing Information Protocol  
 c) Distance Vector Protocol  
 d) Ad hoc On- demand Distance Vector Protocol
- 6) Which is another useful characteristics of X.25 \_\_\_\_\_.  
 a) Speed  
 b) Matching  
 c) Speed matching  
 d) None of these
- 7) Retransmission of packets must be done when \_\_\_\_\_.  
 a) Packet is lost  
 b) Packet is corrupted  
 c) Packet is needed  
 d) All of the mentioned
- 8) ATM stands for \_\_\_\_\_.  
 a) Automatic teller machine  
 b) Automated teller machine  
 c) Automatic transfer machine  
 d) Asynchronous transfer mode

- 9) \_\_\_\_\_ are the algorithms are available to update contents of routing tables.
- a) Distance-Vector Protocol
  - b) Link-State Protocol
  - c) Both a & b
  - d) None of these
- 10) X.25 provides a virtual high-quality digital network at \_\_\_\_\_.
- a) Low cost
  - b) High cost
  - c) Medium cost
  - d) All of these
- 11) Cell relay is data transmission services that uses transmission technology referred to as \_\_\_\_\_.
- a) ATM
  - b) BTM
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- 12) The data transmission is a fixed length of data known as \_\_\_\_\_.
- a) Cell
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- 13) VP is a bundle of \_\_\_\_\_.
- a) VCs
  - b) VCM
  - c) VCI
  - d) VIP
- 14) ATM networks are used to carry \_\_\_\_\_ information mostly.
- a) Voice
  - b) Video
  - c) Data
  - d) All of these

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**BROADBAND COMMUNICATION**

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

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**Section – I**

- Q.2 Attempt any four. 16**
- a) What are different routing methods and control signals used in circuit switched networks?
  - b) What are X.25 Devices and Protocol Operation?
  - c) Specify frame relay devices. What are switched VC and permanent VC related to frame relay? What is DLCI and specify its importance.
  - d) What are benefits of ATM? What is ATM network interface? How ATM device is connected to ATM network?
  - e) Discuss call establishment procedure in ATM.
- Q.3 Attempt any two. 12**
- a) Draw ATM cell format and describe it in detail.
  - b) Draw LAPP core protocol and discuss in detail.
  - c) Explain PCR algorithm related to ATM.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Why buffers are requirement in ATM switches? How buffer placement is plays important role in case of high speed communication?
  - b) How many channels are there in ISDN over which data communication is possible? Explain multi framing environment in ISDN.
  - c) List different channels available for data transfer in case of ISDN. Explain various channel structures in ISDN.
  - d) What is contention in ISDN? How contention is resolved on D-Channel in ISDN?
  - e) Discuss IEEE 802.16 MAC sublayer and discuss services related to IEEE 802.16.
- Q.5 Attempt any two. 12**
- a) What is rate adaption in ISDN? Explain different rate adaption methods.
  - b) Discuss AODV protocol related to MANET.
  - c) What are ISDN compatible and ISDN incompatible devices? Draw UNI architecture for ISDN and explain in detail.



- 9) Which is another useful characteristics of X.25 \_\_\_\_\_.
- |                   |                  |
|-------------------|------------------|
| a) Speed          | b) Matching      |
| c) Speed matching | d) None of these |
- 10) Retransmission of packets must be done when \_\_\_\_\_.
- |                     |                         |
|---------------------|-------------------------|
| a) Packet is lost   | b) Packet is corrupted  |
| c) Packet is needed | d) All of the mentioned |
- 11) ATM stands for \_\_\_\_\_.
- |                               |                               |
|-------------------------------|-------------------------------|
| a) Automatic teller machine   | b) Automated teller machine   |
| c) Automatic transfer machine | d) Asynchronous transfer mode |
- 12) \_\_\_\_\_ are the algorithms are available to update contents of routing tables.
- |                             |                        |
|-----------------------------|------------------------|
| a) Distance-Vector Protocol | b) Link-State Protocol |
| c) Both a & b               | d) None of these       |
- 13) X.25 provides a virtual high-quality digital network at \_\_\_\_\_.
- |                |                 |
|----------------|-----------------|
| a) Low cost    | b) High cost    |
| c) Medium cost | d) All of these |
- 14) Cell relay is data transmission services that uses transmission technology referred to as \_\_\_\_\_.
- |        |        |
|--------|--------|
| a) ATM | b) BTM |
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Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**BROADBAND COMMUNICATION**

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

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  - e) Discuss IEEE 802.16 MAC sublayer and discuss services related to IEEE 802.16.
- Q.5 Attempt any two.** **12**
- a) What is rate adaption in ISDN? Explain different rate adaption methods.
  - b) Discuss AODV protocol related to MANET.
  - c) What are ISDN compatible and ISDN incompatible devices? Draw UNI architecture for ISDN and explain in detail.

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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- 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) In SONET, duration of any frame is \_\_\_\_\_ micro seconds.
  - a) 110?
  - b) 120?
  - c) 125?
  - d) 135?
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  - a) Open-loop and Closed-loop
  - b) Open-control and Closed-control
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  - d) None of the mentioned
- 3) What is the routing algorithm used in MANETs?
  - a) Shortest Path First
  - b) Routing Information Protocol
  - c) Distance Vector Protocol
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- 4) Which is another useful characteristics of X.25 \_\_\_\_\_.
  - a) Speed
  - b) Matching
  - c) Speed matching
  - d) None of these
- 5) Retransmission of packets must be done when \_\_\_\_\_.
  - a) Packet is lost
  - b) Packet is corrupted
  - c) Packet is needed
  - d) All of the mentioned
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- 7) \_\_\_\_\_ are the algorithms are available to update contents of routing tables.
  - a) Distance-Vector Protocol
  - b) Link-State Protocol
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- 8) X.25 provides a virtual high-quality digital network at \_\_\_\_\_.
  - a) Low cost
  - b) High cost
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  - d) All of these



- 9) Cell relay is data transmission services that uses transmission technology referred to as \_\_\_\_\_.
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- a) Voice
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  - c) Data
  - d) All of these
- 13) ISDN stands for \_\_\_\_\_.
- a) Integrated Services Digital Network
  - b) Integrated Services Discrete Network
  - c) Integrated Services Digital Node
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- 14) ISDN is based on the concept of \_\_\_\_\_.
- a) SS7
  - b) CCS
  - c) ARDIS
  - d) CDPD

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**BROADBAND COMMUNICATION**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
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**Section – I**

- Q.2 Attempt any four. 16**
- a) What are different routing methods and control signals used in circuit switched networks?
  - b) What are X.25 Devices and Protocol Operation?
  - c) Specify frame relay devices. What are switched VC and permanent VC related to frame relay? What is DLCI and specify its importance.
  - d) What are benefits of ATM? What is ATM network interface? How ATM device is connected to ATM network?
  - e) Discuss call establishment procedure in ATM.
- Q.3 Attempt any two. 12**
- a) Draw ATM cell format and describe it in detail.
  - b) Draw LAPF core protocol and discuss in detail.
  - c) Explain PCR algorithm related to ATM.

**Section – II**

- Q.4 Attempt any four. 16**
- a) Why buffers are requirement in ATM switches? How buffer placement is plays important role in case of high speed communication?
  - b) How many channels are there in ISDN over which data communication is possible? Explain multi framing environment in ISDN.
  - c) List different channels available for data transfer in case of ISDN. Explain various channel structures in ISDN.
  - d) What is contention in ISDN? How contention is resolved on D-Channel in ISDN?
  - e) Discuss IEEE 802.16 MAC sublayer and discuss services related to IEEE 802.16.
- Q.5 Attempt any two. 12**
- a) What is rate adaption in ISDN? Explain different rate adaption methods.
  - b) Discuss AODV protocol related to MANET.
  - c) What are ISDN compatible and ISDN incompatible devices? Draw UNI architecture for ISDN and explain in detail.

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PLC AND INDUSTRIAL CONTROLLERS**

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

Max. Marks: 70

- 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**

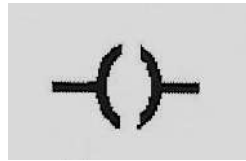
Duration: 30 Minutes

Marks: 14

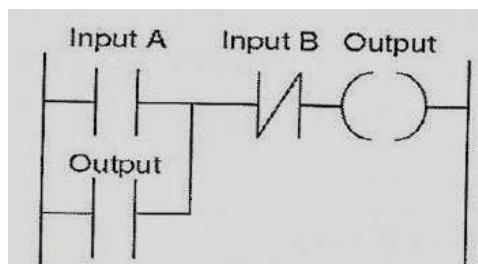
**Q.1 Choose the correct alternatives from the options and rewrite the answer. 14**

- 1) Functional Block Diagram Programming consists primarily of \_\_\_\_\_.
  - a) logic gate symbol and connecting lines
  - b) virtual relay contacts and coils
  - c) function blocks and connecting lines
  - d) text-based codes
- 2) Scan time in PLC depends upon \_\_\_\_\_.
  - a) SMPS
  - b) Linear power supply
  - c) Number of rows in a ladder
  - d) None of the above
- 3) Open loop control systems are \_\_\_\_\_.
  - i) More stable than closed loop systems.
  - ii) Easy to design than closed loop systems.
  - a) Both i and ii are true
  - b) i is true and ii is false
  - c) i is false and ii is true
  - d) Both i and ii are false
- 4) For a 15-bit register, which is the largest integer number a PLC counter function can reach \_\_\_\_\_.
  - a) 32,768
  - b) 65,535
  - c) 65,536
  - d) 32,767
- 5) A counter that starts from a specified number and increments/ decrements up to maximum/minimum count is known as the \_\_\_\_\_.
  - a) Up counter
  - b) Down counter
  - c) Up/Down counter
  - d) Cascading counter
- 6) To protect a PLC from any incoming surges from the field, an isolated device such as \_\_\_\_\_ is used.
  - a) Transformer
  - b) Transducer
  - c) Relay
  - d) None of these
- 7) DC motor control is achieved using \_\_\_\_\_.
  - a) PWM
  - b) Frequency modulation
  - c) Amplitude modulation
  - d) None of the above

8) The PLC contact shown in figure is \_\_\_\_\_.



- a) A normally open coil
  - b) Negating Coil
  - c) A normally closed coil
  - d) None of the above
- 9) Which among the following represents an illustration of closed loop system?
- a) Washing machine
  - b) Automatic electric iron
  - c) Bread toaster
  - d) Electric hand drier
- 10) The output is said to be zero state response because \_\_\_\_\_ conditions are made equal to zero.
- a) Initial
  - b) Final
  - c) Steady state
  - d) Impulse response
- 11) The 2's complement representation of signed number 0 is \_\_\_\_\_.
- a) 00000000
  - b) 00000010
  - c) 11111110
  - d) 11111101
- 12) \_\_\_\_\_ is a device that converts energy to mechanical motion.
- a) Sensors
  - b) Actuators
  - c) Transducers
  - d) Amplifiers
- 13) The term reset control refers to \_\_\_\_\_.
- a) Proportional
  - b) Integral
  - c) Derivative
  - d) None of the above
- 14) The ladder diagram shown is for \_\_\_\_\_.



- a) Latch circuit
- b) NOR gate
- c) EXOR gate
- d) NAND gate

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019  
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PLC AND INDUSTRIAL CONTROLLERS**

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Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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3) Assume suitable data if necessary.

**Section – I**

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

- Draw the gate and ladder logic for Boolean equations
  - $A'B' + C'D' = Y$
  - $AB + A'B' = Y$
- Why SMPS is preferred over linear power supply in case of PLC?
- What are different I/O modules in PLC's?
- What are the different languages used for programming of PLC's? Discuss FBD with example.
- State advantages of PLC's over hard wired relays.

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

- Draw and discuss block diagram of PLC in detail.
- Draw and explain delay on and delay off timers in PLC.
- Draw and explain the ladder diagram for automatic bottle filling plant.

**Section – II**

**Q.4 Attempt any four of the following questions. 16**

- Write short note on hydraulic actuation system.
- Write short note on temperature sensors.
- What are the different components of robotic system? Explain with neat diagrams.
- Design converter for conversion of 4mA to 20mA into -3v to +3v using grounded load.
- Describe design of control logic for DAS.

**Q.5 Attempt any two of the following questions. 12**

- Design 2 Channel Data Acquisition System with the following specifications  
Channel 1:
  - Temp. Range  $-0^{\circ}$  to  $800^{\circ}\text{C}$
  - Sensor – Thermocouple
 Channel 2
  - Temp. Range  $-0^{\circ}$  to  $80^{\circ}\text{C}$
  - Sensor - LM35
- List down the semiconductor sensors. Explain any two sensors in detail with neat diagrams.
- Derive a mathematical model for Proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.

Seat  
No.

**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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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 answer. 14**

- 1) The PLC contact shown in figure is \_\_\_\_\_.



- a) A normally open coil                      b) Negating Coil  
 c) A normally closed coil                    d) None of the above
- 2) Which among the following represents an illustration of closed loop system?  
 a) Washing machine                            b) Automatic electric iron  
 c) Bread toaster                                d) Electric hand drier
- 3) The output is said to be zero state response because \_\_\_\_\_ conditions are made equal to zero.  
 a) Initial    b) Final  
 c) Steady state                                    d) Impulse response
- 4) The 2's complement representation of signed number 0 is \_\_\_\_\_.  
 a) 00000000                                      b) 00000010  
 c) 11111110                                      d) 11111101
- 5) \_\_\_\_\_ is a device that converts energy to mechanical motion.  
 a) Sensors                                         b) Actuators  
 c) Transducers                                 d) Amplifiers
- 6) The term reset control refers to \_\_\_\_\_.  
 a) Proportional                                    b) Integral  
 c) Derivative                                      d) None of the above



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**Section – I**

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

- a) Draw the gate and ladder logic for Boolean equations
  - i)  $A'B' + C'D' = Y$
  - ii)  $AB + A'B' = Y$
- b) Why SMPS is preferred over linear power supply in case of PLC?
- c) What are different I/O modules in PLC's?
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- a) Write short note on hydraulic actuation system.
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- c) What are the different components of robotic system? Explain with neat diagrams.
- d) Design converter for conversion of 4mA to 20mA into -3v to +3v using grounded load.
- e) Describe design of control logic for DAS.

**Q.5 Attempt any two of the following questions. 12**

- a) Design 2 Channel Data Acquisition System with the following specifications
 

Channel 1:

  - i) Temp. Range  $-0^{\circ}$  to  $800^{\circ}\text{C}$
  - ii) Sensor – Thermocouple

Channel 2

  - i) Temp. Range  $-0^{\circ}$  to  $80^{\circ}\text{C}$
  - ii) Sensor - LM35
- b) List down the semiconductor sensors. Explain any two sensors in detail with neat diagrams.
- c) Derive a mathematical model for Proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.







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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**PLC AND INDUSTRIAL CONTROLLERS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

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

- a) Draw the gate and ladder logic for Boolean equations
  - i)  $A'B' + C'D' = Y$
  - ii)  $AB + A'B' = Y$
- b) Why SMPS is preferred over linear power supply in case of PLC?
- c) What are different I/O modules in PLC's?
- d) What are the different languages used for programming of PLC's? Discuss FBD with example.
- e) State advantages of PLC's over hard wired relays.

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

- a) Draw and discuss block diagram of PLC in detail.
- b) Draw and explain delay on and delay off timers in PLC.
- c) Draw and explain the ladder diagram for automatic bottle filling plant.

**Section – II**

**Q.4 Attempt any four of the following questions. 16**

- a) Write short note on hydraulic actuation system.
- b) Write short note on temperature sensors.
- c) What are the different components of robotic system? Explain with neat diagrams.
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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**PLC AND INDUSTRIAL CONTROLLERS**

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

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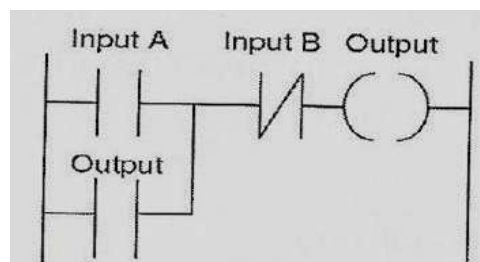
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

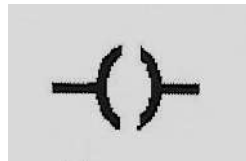
**Q.1 Choose the correct alternatives from the options and rewrite the answer. 14**

- 1) The output is said to be zero state response because \_\_\_\_\_ conditions are made equal to zero.
  - a) Initial
  - b) Final
  - c) Steady state
  - d) Impulse response
- 2) The 2's complement representation of signed number 0 is \_\_\_\_\_.
  - a) 00000000
  - b) 00000010
  - c) 11111110
  - d) 11111101
- 3) \_\_\_\_\_ is a device that converts energy to mechanical motion.
  - a) Sensors
  - b) Actuators
  - c) Transducers
  - d) Amplifiers
- 4) The term reset control refers to \_\_\_\_\_.
  - a) Proportional
  - b) Integral
  - c) Derivative
  - d) None of the above
- 5) The ladder diagram shown is for \_\_\_\_\_.



- a) Latch circuit
  - b) NOR gate
  - c) EXOR gate
  - d) NAND gate
- 6) Functional Block Diagram Programming consists primarily of \_\_\_\_\_.
    - a) logic gate symbol and connecting lines
    - b) virtual relay contacts and coils
    - c) function blocks and connecting lines
    - d) text-based codes
  - 7) Scan time in PLC depends upon \_\_\_\_\_.
    - a) SMPS
    - b) Linear power supply
    - c) Number of rows in a ladder
    - d) None of the above

- 8) Open loop control systems are \_\_\_\_\_.
- More stable than closed loop systems.
  - Easy to design than closed loop systems.
- Both i and ii are true
  - i is true and ii is false
  - i is false and ii is true
  - Both i and ii are false
- 9) For a 15-bit register, which is the largest integer number a PLC counter function can reach \_\_\_\_\_.
- 32,768
  - 65,535
  - 65,536
  - 32,767
- 10) A counter that starts from a specified number and increments/ decrements up to maximum/minimum count is known as the \_\_\_\_\_.
- Up counter
  - Down counter
  - Up/Down counter
  - Cascading counter
- 11) To protect a PLC from any incoming surges from the field, an isolated device such as \_\_\_\_\_ is used.
- Transformer
  - Transducer
  - Relay
  - None of these
- 12) DC motor control is achieved using \_\_\_\_\_.
- PWM
  - Frequency modulation
  - Amplitude modulation
  - None of the above
- 13) The PLC contact shown in figure is \_\_\_\_\_.



- A normally open coil
  - Negating Coil
  - A normally closed coil
  - None of the above
- 14) Which among the following represents an illustration of closed loop system?
- Washing machine
  - Automatic electric iron
  - Bread toaster
  - Electric hand drier

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019  
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  - $A'B' + C'D' = Y$
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- Write short note on hydraulic actuation system.
- Write short note on temperature sensors.
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 Channel 2
  - Temp. Range  $-0^{\circ}$  to  $80^{\circ}\text{C}$
  - Sensor - LM35
- List down the semiconductor sensors. Explain any two sensors in detail with neat diagrams.
- Derive a mathematical model for Proportional controller. Explain electronic proportional (P) controller with necessary circuit diagrams.

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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INTERNET OF THINGS**

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

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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 \_\_\_\_\_ Timer is a basic countdown timer that can be used to generate interrupts at regular time intervals, even when the system is in sleep mode.
  - a) SYSTICK
  - b) Watchdog
  - c) Repetitive Interrupt Timer
  - d) None of these
- 2) The \_\_\_\_\_ flag is set when in subtract operation borrow did not occur.
  - a) Carry
  - b) Negative
  - c) Zero
  - d) Overflow
- 3) To force logic '0' on port pin P1.20, \_\_\_\_\_ register is used in LPC1768.
  - a) FIO1CLR
  - b) FIO2CLR
  - c) FIO0CLR
  - d) FIO3CLR
- 4) LPC1768 has on-chip \_\_\_\_\_ KB flash memory and \_\_\_\_\_ KB SRAM.
  - a) 30, 16
  - b) 128, 32
  - c) 256, 40
  - d) 512, 64
- 5) After the execution of following ARM instruction the content of R0 register will be \_\_\_\_\_.  
 ADD R0, R1, R1, LSL #2
  - a)  $R1 + (R1 * 4)$
  - b)  $R1 + (R1 * 3)$
  - c)  $R1 + (R1 / 4)$
  - d)  $R1 + (R1 / 3)$
- 6) Highest priority exception in ARM Cortex-M3 processor is \_\_\_\_\_.
  - a) Reset
  - b) Hard fault
  - c) Bus fault
  - d) NMI
- 7) What is the value of R1 after MVN R1, #7 is executed?
  - a) 0x00000007
  - b) 0xFFFFFFFF8
  - c) 0xFFFFF8
  - d) 0xFFFFF9
- 8) RFID is an acronym for \_\_\_\_\_.
  - a) Radio frequency Identification
  - b) Random frequency Identification
  - c) Radio frequency Identity
  - d) Random frequency Identity

- 9) With respect to the IEEE 802.15.4 standard which statement is true?
- a) It is a low data-rate standard
  - b) Used for architecting wireless PANs
  - c) Uses only two layers - PHY and MAC
  - d) All of these
- 10) In MQTT the central communication point is \_\_\_\_\_.
- a) MQTT broker
  - b) MQTT publisher
  - c) MQTT subscriber
  - d) None of the above
- 11) Infrastructure -Cloud deals with \_\_\_\_\_.
- a) Infrastructure-as-a-Service
  - b) Infrastructure-in-Cloud
  - c) Infrastructure-for-Service
  - d) None of above
- 12) \_\_\_\_\_ supports a long-range communication.
- a) ZigBee
  - b) GPRS
  - c) Bluetooth
  - d) All of the above
- 13) Class-1 Bluetooth devices have a range of: \_\_\_\_\_.
- a) 1 m
  - b) 10 m
  - c) 100m
  - d) 1000m
- 14) Wireless access points uses \_\_\_\_\_.
- a) IEEE 802.15.4 protocol
  - b) IEEE 802.15.6 protocol
  - c) IEEE 802.11 protocol
  - d) None of the above



<b>Seat No.</b>	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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**Section – I**

- Q.2 Attempt any four questions. 16**
- a) What are the architectural layers in a modified OSI model for IoT systems?
  - b) Explain UART interface. When and where this interface is used?
  - c) Write short notes on ARM Cortex M3 operation modes.
  - d) Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
  - e) List down and discuss the flags available in ARM Processors.
- Q.3 Attempt any two questions. 12**
- a) Give examples of IoT used in a smart home with sensors, actuators and smart home automation software.
  - b) List down data processing instruction and discuss any two in details with examples.
  - c) List down call and unconditional branch also discuss any two in details with examples.

**Section – II**

- Q.4 Attempt any four questions. 16**
- a) Write short note on IEEE 802.11 spectrum allocation.
  - b) What is a Bluetooth profile? Discuss a Bluetooth profile in detail.
  - c) Discuss the differences in MOM and RESTful service with neat diagram.
  - d) With neat diagram discuss public and private cloud models.
  - e) Write a short note on RFID Controllers and RFID frequency bands.
- Q.5 Attempt any two questions. 12**
- a) With an example discuss the CoAP NON and CON messaging in detail.
  - b) With a neat diagram discuss the core components of an RFID system.
  - c) What is MQTT protocol? List down the requirements provided by MQTT protocol.

Seat No.	
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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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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) RFID is an acronym for \_\_\_\_\_.  
 a) Radio frequency Identification  
 b) Random frequency Identification  
 c) Radio frequency Identity  
 d) Random frequency Identity
- 2) With respect to the IEEE 802.15.4 standard which statement is true?  
 a) It is a low data-rate standard  
 b) Used for architecting wireless PANs  
 c) Uses only two layers - PHY and MAC  
 d) All of these
- 3) In MQTT the central communication point is \_\_\_\_\_.  
 a) MQTT broker  
 b) MQTT publisher  
 c) MQTT subscriber  
 d) None of the above
- 4) Infrastructure -Cloud deals with \_\_\_\_\_.  
 a) Infrastructure-as-a-Service  
 b) Infrastructure-in-Cloud  
 c) Infrastructure-for-Service  
 d) None of above
- 5) \_\_\_\_\_ supports a long-range communication.  
 a) ZigBee  
 b) GPRS  
 c) Bluetooth  
 d) All of the above
- 6) Class-1 Bluetooth devices have a range of: \_\_\_\_\_.  
 a) 1 m  
 b) 10 m  
 c) 100m  
 d) 1000m
- 7) Wireless access points uses \_\_\_\_\_.  
 a) IEEE 802.15.4 protocol  
 b) IEEE 802.15.6 protocol  
 c) IEEE 802.11 protocol  
 d) None of the above
- 8) The \_\_\_\_\_ Timer is a basic countdown timer that can be used to generate interrupts at regular time intervals, even when the system is in sleep mode.  
 a) SYSTICK  
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 c) Repetitive Interrupt Timer  
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- 9) The \_\_\_\_\_ flag is set when in subtract operation borrow did not occur.
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- a) 30, 16
  - b) 128, 32
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- 12) After the execution of following ARM instruction the content of R0 register will be \_\_\_\_\_.
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- 14) What is the value of R1 after MVN R1, #7 is executed?
- a) 0x00000007
  - b) 0xFFFFFFFF8
  - c) 0xFFFFF8FA
  - d) 0xFFFFF9

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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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- Q.3 Attempt any two questions. 12**
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**Section – II**

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- 9) Class-1 Bluetooth devices have a range of: \_\_\_\_\_.
- |         |          |
|---------|----------|
| a) 1 m  | b) 10 m  |
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- |                           |                           |
|---------------------------|---------------------------|
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  - c) 0xFFFFFA
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- 14) With respect to the IEEE 802.15.4 standard which statement is true?
- a) It is a low data-rate standard
  - b) Used for architecting wireless PANs
  - c) Uses only two layers - PHY and MAC
  - d) All of these

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**B.E. (Part – II) (CGPA) Examination Nov/Dec-2019**  
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**INTERNET OF THINGS**

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  - Write short notes on ARM Cortex M3 operation modes.
  - Discuss the ARM Cortex-M3 special registers in details with neat diagrams.
  - List down and discuss the flags available in ARM Processors.
- Q.3 Attempt any two questions. 12**
- Give examples of IoT used in a smart home with sensors, actuators and smart home automation software.
  - List down data processing instruction and discuss any two in details with examples.
  - List down call and unconditional branch also discuss any two in details with examples.

**Section – II**

- Q.4 Attempt any four questions. 16**
- Write short note on IEEE 802.11 spectrum allocation.
  - What is a Bluetooth profile? Discuss a Bluetooth profile in detail.
  - Discuss the differences in MOM and RESTful service with neat diagram.
  - With neat diagram discuss public and private cloud models.
  - Write a short note on RFID Controllers and RFID frequency bands.
- Q.5 Attempt any two questions. 12**
- With an example discuss the CoAP NON and CON messaging in detail.
  - With a neat diagram discuss the core components of an RFID system.
  - What is MQTT protocol? List down the requirements provided by MQTT protocol.

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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Two types of decision support systems are \_\_\_\_\_.  
 a) model driven, data driven                      b) data based, information based  
 c) middle, upper                                      d) TPS, ERP
- 2) The major cost incurred in implementing ERP is due to \_\_\_\_\_.  
 a) hardware    b) software  
 c) training    d) reengineering
- 3) As the cost of IS \_\_\_\_\_, it is substituted for labor which is \_\_\_\_\_.  
 a) increasing, increasing                              b) decreasing, increasing  
 c) decreasing, decreasing                              d) increasing, decreasing
- 4) Take odd man out - NEFT, ERP, RTGS, UPI  
 a) NEFT    b) ERP  
 c) RTGS    d) UPI
- 5) An IT project can produce \_\_\_\_\_.  
 a) a system    b) software  
 c) recommendations                                      d) all of these
- 6) Which of below is not a resource for a software project?  
 a) money    b) people  
 c) constraints    d) technology
- 7) Two types of integrations in SDLC are \_\_\_\_\_.  
 a) software level & system level                      b) data & database  
 c) requirement & design                                d) all of these
- 8) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.  
 a) RAD    b) Waterfall  
 c) Prototyping    d) SDLC
- 9) Two types of project requirement specifications are \_\_\_\_\_.  
 a) managerial & related to customer.  
 b) related to developer & related to customer.  
 c) functional & quality  
 d) low level & high level

- 10) Collection of computing systems used by organization in Information System is referred as \_\_\_\_\_.  
a) information technology                      b) ERP  
c) computing systems                          d) TPS
- 11) Data items that has been organized so that it has a particular value & meaning to recipient is called \_\_\_\_\_.  
a) data mart                                      b) data store  
c) information                                  d) knowledge
- 12) Which of below is not a function of DBMS?  
a) quality                                        b) synch  
c) enrichment                                  d) forecasting
- 13) Which of below is not true about organizations?  
a) closed system                              b) social unit  
c) interact with environment              d) have a structure
- 14) SETI@home is an example of \_\_\_\_\_.  
a) cloud computing                          b) grid computing  
c) govt. e commerce                        d) none of these

<b>Seat No.</b>	
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**Set P**

**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019  
Electronics Engineering  
INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Solve any two. 12**  
a) Explain partitioned database with - diagram, advantages and disadvantages.  
b) With suitable example explain electronic supply chain management.  
c) With suitable example explain - ERP system.
- Q.3 Solve any four 16**  
a) What is business analytics? What are its types?  
b) With suitable example explain service oriented architecture.  
c) With suitable example explain PAAS model of cloud computing.  
d) With suitable example explain B2B model of E Commerce.  
e) With suitable example explain E Commerce and E Business.

**Section – II**

- Q.4 Solve any two 12**  
a) Discuss in brief any six attributes of software project.  
b) What is Project Management Body of Knowledge?  
c) Explain economical impact of IS on organization.
- Q.5 Solve any four 16**  
a) What are activities involved in software project management?  
b) Discuss social issues related to information systems.  
c) With suitable example discuss project requirement specifications.  
d) What are the causes of software project overrun?  
e) What are the different roles of the individuals required in successful completion of software project?

Seat No.	
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Set **Q**

**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
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 3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.
  - a) RAD
  - b) Waterfall
  - c) Prototyping
  - d) SDLC
- 2) Two types of project requirement specifications are \_\_\_\_\_.
  - a) managerial & related to customer.
  - b) related to developer & related to customer.
  - c) functional & quality
  - d) low level & high level
- 3) Collection of computing systems used by organization in Information System is referred as \_\_\_\_\_.
  - a) information technology
  - b) ERP
  - c) computing systems
  - d) TPS
- 4) Data items that has been organized so that it has a particular value & meaning to recipient is called \_\_\_\_\_.
  - a) data mart
  - b) data store
  - c) information
  - d) knowledge
- 5) Which of below is not a function of DBMS?
  - a) quality
  - b) synch
  - c) enrichment
  - d) forecasting
- 6) Which of below is not true about organizations?
  - a) closed system
  - b) social unit
  - c) interact with environment
  - d) have a structure
- 7) SETI@home is an example of \_\_\_\_\_.
  - a) cloud computing
  - b) grid computing
  - c) govt. e commerce
  - d) none of these
- 8) Two types of decision support systems are \_\_\_\_\_.
  - a) model driven, data driven
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- 9) The major cost incurred in implementing ERP is due to \_\_\_\_\_.
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  - d) reengineering

- 10) As the cost of IS \_\_\_\_\_, it is substituted for labor which is \_\_\_\_\_.
- a) increasing, increasing
  - b) decreasing, increasing
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- 11) Take odd man out - NEFT, ERP, RTGS, UPI
- a) NEFT
  - b) ERP
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- 12) An IT project can produce \_\_\_\_\_.
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  - c) constraints
  - d) technology
- 14) Two types of integrations in SDLC are \_\_\_\_\_.
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  - b) data & database
  - c) requirement & design
  - d) all of these

<b>Seat No.</b>	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Solve any two.** **12**
- a) Explain partitioned database with - diagram, advantages and disadvantages.
  - b) With suitable example explain electronic supply chain management.
  - c) With suitable example explain - ERP system.
- Q.3 Solve any four** **16**
- a) What is business analytics? What are its types?
  - b) With suitable example explain service oriented architecture.
  - c) With suitable example explain PAAS model of cloud computing.
  - d) With suitable example explain B2B model of E Commerce.
  - e) With suitable example explain E Commerce and E Business.

**Section – II**

- Q.4 Solve any two** **12**
- a) Discuss in brief any six attributes of software project.
  - b) What is Project Management Body of Knowledge?
  - c) Explain economical impact of IS on organization.
- Q.5 Solve any four** **16**
- a) What are activities involved in software project management?
  - b) Discuss social issues related to information systems.
  - c) With suitable example discuss project requirement specifications.
  - d) What are the causes of software project overrun?
  - e) What are the different roles of the individuals required in successful completion of software project?



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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.  
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 3) Assume suitable data wherever necessary.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) An IT project can produce \_\_\_\_\_.
 

a) a system	b) software
c) recommendations	d) all of these
- 2) Which of below is not a resource for a software project?
 

a) money	b) people
c) constraints	d) technology
- 3) Two types of integrations in SDLC are \_\_\_\_\_.
 

a) software level & system level	b) data & database
c) requirement & design	d) all of these
- 4) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.
 

a) RAD	b) Waterfall
c) Prototyping	d) SDLC
- 5) Two types of project requirement specifications are \_\_\_\_\_.
 

a) managerial & related to customer.	b) related to developer & related to customer.
c) functional & quality	d) low level & high level
- 6) Collection of computing systems used by organization in Information System is referred as \_\_\_\_\_.
 

a) information technology	b) ERP
c) computing systems	d) TPS
- 7) Data items that has been organized so that it has a particular value & meaning to recipient is called \_\_\_\_\_.
 

a) data mart	b) data store
c) information	d) knowledge
- 8) Which of below is not a function of DBMS?
 

a) quality	b) synch
c) enrichment	d) forecasting
- 9) Which of below is not true about organizations?
 

a) closed system	b) social unit
c) interact with environment	d) have a structure

- 14) SETI@home is an example of \_\_\_\_\_.  
a) cloud computing                      b) grid computing  
c) govt. e commerce                      d) none of these
- 11) Two types of decision support systems are \_\_\_\_\_.  
a) model driven, data driven              b) data based, information based  
c) middle, upper                              d) TPS, ERP
- 12) The major cost incurred in implementing ERP is due to \_\_\_\_\_.  
a) hardware                                      b) software  
c) training                                        d) reengineering
- 13) As the cost of IS \_\_\_\_\_, it is substituted for labor which is \_\_\_\_\_.  
a) increasing, increasing                      b) decreasing, increasing  
c) decreasing, decreasing                      d) increasing, decreasing
- 14) Take odd man out - NEFT, ERP, RTGS, UPI  
a) NEFT    b) ERP  
c) RTGS    d) UPI

<b>Seat No.</b>	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Solve any two.** **12**
- a) Explain partitioned database with - diagram, advantages and disadvantages.
  - b) With suitable example explain electronic supply chain management.
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- a) What is business analytics? What are its types?
  - b) With suitable example explain service oriented architecture.
  - c) With suitable example explain PAAS model of cloud computing.
  - d) With suitable example explain B2B model of E Commerce.
  - e) With suitable example explain E Commerce and E Business.

**Section – II**

- Q.4 Solve any two** **12**
- a) Discuss in brief any six attributes of software project.
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  - c) Explain economical impact of IS on organization.
- Q.5 Solve any four** **16**
- a) What are activities involved in software project management?
  - b) Discuss social issues related to information systems.
  - c) With suitable example discuss project requirement specifications.
  - d) What are the causes of software project overrun?
  - e) What are the different roles of the individuals required in successful completion of software project?

Seat No.	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternatives from the options.**

**14**

- 1) Collection of computing systems used by organization in Information System is referred as \_\_\_\_\_.  
 a) information technology                      b) ERP  
 c) computing systems                          d) TPS
- 2) Data items that has been organized so that it has a particular value & meaning to recipient is called \_\_\_\_\_.  
 a) data mart                                      b) data store  
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- 3) Which of below is not a function of DBMS?  
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 a) model driven, data driven                b) data based, information based  
 c) middle, upper                                d) TPS, ERP
- 7) The major cost incurred in implementing ERP is due to \_\_\_\_\_.  
 a) hardware                                    b) software  
 c) training                                        d) reengineering
- 8) As the cost of IS \_\_\_\_\_, it is substituted for labor which is \_\_\_\_\_.  
 a) increasing, increasing                    b) decreasing, increasing  
 c) decreasing, decreasing                  d) increasing, decreasing
- 9) Take odd man out - NEFT, ERP, RTGS, UPI  
 a) NEFT    b) ERP  
 c) RTGS                                         d) UPI
- 10) An IT project can produce \_\_\_\_\_.  
 a) a system                                      b) software  
 c) recommendations                         d) all of these

- 11) Which of below is not a resource for a software project?
- a) money
  - b) people
  - c) constraints
  - d) technology
- 12) Two types of integrations in SDLC are \_\_\_\_\_.
- a) software level & system level
  - b) data & database
  - c) requirement & design
  - d) all of these
- 13) In \_\_\_\_\_ model, typically, the outcome of one phase acts as the input for the next phase sequentially.
- a) RAD
  - b) Waterfall
  - c) Prototyping
  - d) SDLC
- 14) Two types of project requirement specifications are \_\_\_\_\_.
- a) managerial & related to customer.
  - b) related to developer & related to customer.
  - c) functional & quality
  - d) low level & high level

<b>Seat No.</b>	
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**T.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY AND MANAGEMENT**

Day & Date: Monday, 16-12-2019  
Time: 02:30 PM To 05:30 PM

Max. Marks: 56

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

**Section – I**

- Q.2 Solve any two.** **12**  
a) Explain partitioned database with - diagram, advantages and disadvantages.  
b) With suitable example explain electronic supply chain management.  
c) With suitable example explain - ERP system.
- Q.3 Solve any four** **16**  
a) What is business analytics? What are its types?  
b) With suitable example explain service oriented architecture.  
c) With suitable example explain PAAS model of cloud computing.  
d) With suitable example explain B2B model of E Commerce.  
e) With suitable example explain E Commerce and E Business.

**Section – II**

- Q.4 Solve any two** **12**  
a) Discuss in brief any six attributes of software project.  
b) What is Project Management Body of Knowledge?  
c) Explain economical impact of IS on organization.
- Q.5 Solve any four** **16**  
a) What are activities involved in software project management?  
b) Discuss social issues related to information systems.  
c) With suitable example discuss project requirement specifications.  
d) What are the causes of software project overrun?  
e) What are the different roles of the individuals required in successful completion of software project?

Seat No.	
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Set **P**

**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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 a classical problem of synchronization?
  - a) The Bounded buffer problem
  - b) The Dining-Philosophers problem
  - c) The Readers-Writers problem
  - d) All
- 2) A \_\_\_\_\_ is a basic unit of CPU Utilization comprises a program counter, a register set and a stack.
  - a) Program
  - b) Throughput
  - c) Thread
  - d) CPU memory
- 3) \_\_\_\_\_ time is the time from submission of a request until the first response is produced.
  - a) Waiting
  - b) Turnaround
  - c) Response
  - d) Throughput
- 4) Shortest next CPU burst algorithm is known as \_\_\_\_\_ scheduling algorithm.
  - a) FCFS
  - b) Shortest Job First
  - c) Round Robin
  - d) Priority
- 5) The \_\_\_\_\_ is the module that gives control of the CPU to the process selected by the short-term scheduler.
  - a) Switcher
  - b) Pager
  - c) Dispatcher
  - d) Swapper
- 6) A major problem with priority scheduling is indefinite blocking or starvation.
  - a) True
  - b) False
  - c) Can't Say
  - d) None of above
- 7) When the messages are sent to and receive from mailboxes or ports it is \_\_\_\_\_ communication.
  - a) Thread
  - b) Semaphore
  - c) Direct
  - d) Indirect
- 8) The file name is generally split into two parts \_\_\_\_\_.
  - a) name & identifier
  - b) identifier & type
  - c) extension & name
  - d) type & extension

- 9) The valid - invalid bit, in this case, what valid indicates \_\_\_\_\_.
- a) the page is not legal
  - b) the page is illegal
  - c) the page is in memory
  - d) the page is not in memory
- 10) Physical memory is broken into fixed-sized blocks called \_\_\_\_\_.
- a) frames
  - b) pages
  - c) backing store
  - d) none of the mentioned
- 11) If a page number is not found in the TLB, then it is known as a \_\_\_\_\_.
- a) TLB miss
  - b) Buffer miss
  - c) TLB hit
  - d) All of the mentioned
- 12) Deadlock prevention is a set of methods \_\_\_\_\_.
- a) to decide if the requested resources for a process have to be given or not
  - b) to ensure that all of the necessary conditions do not hold
  - c) to ensure that at least one of the necessary conditions cannot hold
  - d) to recover from a deadlock
- 13) Which one of the following is the deadlock avoidance algorithm?
- a) karn's algorithm
  - b) round-robin algorithm
  - c) elevator algorithm
  - d) banker's algorithm
- 14) When a process begins execution with no pages in memory \_\_\_\_\_.
- a) process execution becomes impossible
  - b) a page fault occurs for every page brought into memory
  - c) process causes system crash
  - d) none of the mentioned



Seat No.	
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Set	P
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday,22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- What is Time-sharing system? Explain in detail.
  - Draw and explain the PCB (Process Control Block).
  - Explain priority scheduling with the help of suitable example.
  - List and Define different Scheduling Criteria.
  - What is Critical Section? List and explain three requirements of a solution to CS problem.

- Q.3 Attempt any two.** **12**
- Consider the following Four Processes arrive at the ready queue at the times shown below:

Process	Burst Time	Arrival Time
P1	8	0
P2	8	0
P3	5	1
P4	2	2

Draw Gantt Chart and calculate the Average Waiting time using FCFS, Preemptive SJF, and RR (time quantum = 2 ms) Scheduling.

- Explain the following:
  - Co operating process
  - Process Creating and Termination
- List classical synchronization problems. Explain The Bounded Buffer Producer-Consumer problem in detail. Provide its solution using semaphore.

**Section – II**

- Q.4 Attempt any four.** **16**
- Elaborate the different file operations.
  - What is deadlock? Describe four necessary conditions for deadlock.
  - What is thrashing? What are the causes of thrashing?
  - Describe swapping with diagram.
  - Compare sequential and direct access methods of a file.

**Q.5 Attempt any two.**

- a) Describe Banker's algorithm for deadlock avoidance.
- b) Consider the following reference string  
1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5  
How many page faults occur for the FIFO and Optimal page replacement algorithms assuming four frames? Which one is having minimum number of page faults?
- c) Define paging? Explain paging hardware implementation.

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- 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) The file name is generally split into two parts \_\_\_\_\_.  
 a) name & identifier                      b) identifier & type  
 c) extension & name                      d) type & extension
- 2) The valid - invalid bit, in this case, what valid indicates \_\_\_\_\_.  
 a) the page is not legal                      b) the page is illegal  
 c) the page is in memory                      d) the page is not in memory
- 3) Physical memory is broken into fixed-sized blocks called \_\_\_\_\_.  
 a) frames                                      b) pages  
 c) backing store                              d) none of the mentioned
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 a) TLB miss                                      b) Buffer miss  
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- 9) A \_\_\_\_\_ is a basic unit of CPU Utilization comprises a program counter, a register set and a stack.
- a) Program
  - b) Throughput
  - c) Thread
  - d) CPU memory
- 10) \_\_\_\_\_ time is the time from submission of a request until the first response is produced.
- a) Waiting
  - b) Turnaround
  - c) Response
  - d) Throughput
- 11) Shortest next CPU burst algorithm is known as \_\_\_\_\_ scheduling algorithm.
- a) FCFS
  - b) Shortest Job First
  - c) Round Robin
  - d) Priority
- 12) The \_\_\_\_\_ is the module that gives control of the CPU to the process selected by the short-term scheduler.
- a) Switcher
  - b) Pager
  - c) Dispatcher
  - d) Swapper
- 13) A major problem with priority scheduling is indefinite blocking or starvation.
- a) True
  - b) False
  - c) Can't Say
  - d) None of above
- 14) When the messages are sent to and receive from mailboxes or ports it is \_\_\_\_\_ communication.
- a) Thread
  - b) Semaphore
  - c) Direct
  - d) Indirect

Seat No.	
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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday,22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- What is Time-sharing system? Explain in detail.
  - Draw and explain the PCB (Process Control Block).
  - Explain priority scheduling with the help of suitable example.
  - List and Define different Scheduling Criteria.
  - What is Critical Section? List and explain three requirements of a solution to CS problem.

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

- a) Consider the following Four Processes arrive at the ready queue at the times shown below:

Process	Burst Time	Arrival Time
P1	8	0
P2	8	0
P3	5	1
P4	2	2

Draw Gantt Chart and calculate the Average Waiting time using FCFS, Preemptive SJF, and RR (time quantum = 2 ms) Scheduling.

- b) Explain the following:
- Co operating process
  - Process Creating and Termination
- c) List classical synchronization problems. Explain The Bounded Buffer Producer-Consumer problem in detail. Provide its solution using semaphore.

**Section – II**

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

- Elaborate the different file operations.
- What is deadlock? Describe four necessary conditions for deadlock.
- What is thrashing? What are the causes of thrashing?
- Describe swapping with diagram.
- Compare sequential and direct access methods of a file.

**Q.5 Attempt any two.**

- a) Describe Banker's algorithm for deadlock avoidance.
- b) Consider the following reference string  
1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5  
How many page faults occur for the FIFO and Optimal page replacement algorithms assuming four frames? Which one is having minimum number of page faults?
- c) Define paging? Explain paging hardware implementation.

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 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 \_\_\_\_\_ is the module that gives control of the CPU to the process selected by the short-term scheduler.
  - a) Switcher
  - b) Pager
  - c) Dispatcher
  - d) Swapper
- 2) A major problem with priority scheduling is indefinite blocking or starvation.
  - a) True
  - b) False
  - c) Can't Say
  - d) None of above
- 3) When the messages are sent to and receive from mailboxes or ports it is \_\_\_\_\_ communication.
  - a) Thread
  - b) Semaphore
  - c) Direct
  - d) Indirect
- 4) The file name is generally split into two parts \_\_\_\_\_.
  - a) name & identifier
  - b) identifier & type
  - c) extension & name
  - d) type & extension
- 5) The valid - invalid bit, in this case, what valid indicates \_\_\_\_\_.
  - a) the page is not legal
  - b) the page is illegal
  - c) the page is in memory
  - d) the page is not in memory
- 6) Physical memory is broken into fixed-sized blocks called \_\_\_\_\_.
  - a) frames
  - b) pages
  - c) backing store
  - d) none of the mentioned
- 7) If a page number is not found in the TLB, then it is known as a \_\_\_\_\_.
  - a) TLB miss
  - b) Buffer miss
  - c) TLB hit
  - d) All of the mentioned
- 8) Deadlock prevention is a set of methods \_\_\_\_\_.
  - a) to decide if the requested resources for a process have to be given or not
  - b) to ensure that all of the necessary conditions do not hold
  - c) to ensure that at least one of the necessary conditions cannot hold
  - d) to recover from a deadlock

- 9) Which one of the following is the deadlock avoidance algorithm?  
a) karn's algorithm                      b) round-robin algorithm  
c) elevator algorithm                  d) banker's algorithm
- 10) When a process begins execution with no pages in memory \_\_\_\_\_.  
a) process execution becomes impossible  
b) a page fault occurs for every page brought into memory  
c) process causes system crash  
d) none of the mentioned
- 11) Which of the following is a classical problem of synchronization?  
a) The Bounded buffer problem  
b) The Dinning-Philosophers problem  
c) The Readers-Writers problem  
d) All
- 12) A \_\_\_\_\_ is a basic unit of CPU Utilization comprises a program counter, a register set and a stack.  
a) Program                                  b) Throughput  
c) Thread                                    d) CPU memory
- 13) \_\_\_\_\_ time is the time from submission of a request until the first response is produced.  
a) Waiting                                  b) Turnaround  
c) Response                                d) Throughput
- 14) Shortest next CPU burst algorithm is known as \_\_\_\_\_ scheduling algorithm.  
a) FCFS                                      b) Shortest Job First  
c) Round Robin                            d) Priority



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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- What is Time-sharing system? Explain in detail.
  - Draw and explain the PCB (Process Control Block).
  - Explain priority scheduling with the help of suitable example.
  - List and Define different Scheduling Criteria.
  - What is Critical Section? List and explain three requirements of a solution to CS problem.

- Q.3 Attempt any two.** **12**
- Consider the following Four Processes arrive at the ready queue at the times shown below:

Process	Burst Time	Arrival Time
P1	8	0
P2	8	0
P3	5	1
P4	2	2

Draw Gantt Chart and calculate the Average Waiting time using FCFS, Preemptive SJF, and RR (time quantum = 2 ms) Scheduling.

- Explain the following:
  - Co operating process
  - Process Creating and Termination
- List classical synchronization problems. Explain The Bounded Buffer Producer-Consumer problem in detail. Provide its solution using semaphore.

**Section – II**

- Q.4 Attempt any four.** **16**
- Elaborate the different file operations.
  - What is deadlock? Describe four necessary conditions for deadlock.
  - What is thrashing? What are the causes of thrashing?
  - Describe swapping with diagram.
  - Compare sequential and direct access methods of a file.

**Q.5 Attempt any two.**

- a) Describe Banker's algorithm for deadlock avoidance.
- b) Consider the following reference string  
1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5  
How many page faults occur for the FIFO and Optimal page replacement algorithms assuming four frames? Which one is having minimum number of page faults?
- c) Define paging? Explain paging hardware implementation.



- 8) \_\_\_\_\_ time is the time from submission of a request until the first response is produced.
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- 10) The \_\_\_\_\_ is the module that gives control of the CPU to the process selected by the short-term scheduler.
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- 11) A major problem with priority scheduling is indefinite blocking or starvation.
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  - d) None of above
- 12) When the messages are sent to and receive from mailboxes or ports it is \_\_\_\_\_ communication.
- a) Thread
  - b) Semaphore
  - c) Direct
  - d) Indirect
- 13) The file name is generally split into two parts \_\_\_\_\_.
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  - c) extension & name
  - d) type & extension
- 14) The valid - invalid bit, in this case, what valid indicates \_\_\_\_\_.
- a) the page is not legal
  - b) the page is illegal
  - c) the page is in memory
  - d) the page is not in memory

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**T.E. (Part – II) (New) (CBCS) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**OPERATING SYSTEMS**

Day & Date: Friday, 22-11-2019  
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

- 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**
- What is Time-sharing system? Explain in detail.
  - Draw and explain the PCB (Process Control Block).
  - Explain priority scheduling with the help of suitable example.
  - List and Define different Scheduling Criteria.
  - What is Critical Section? List and explain three requirements of a solution to CS problem.

- Q.3 Attempt any two.** **12**
- Consider the following Four Processes arrive at the ready queue at the times shown below:

Process	Burst Time	Arrival Time
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P4	2	2

Draw Gantt Chart and calculate the Average Waiting time using FCFS, Preemptive SJF, and RR (time quantum = 2 ms) Scheduling.

- Explain the following:
  - Co operating process
  - Process Creating and Termination
- List classical synchronization problems. Explain The Bounded Buffer Producer-Consumer problem in detail. Provide its solution using semaphore.

**Section – II**

- Q.4 Attempt any four.** **16**
- Elaborate the different file operations.
  - What is deadlock? Describe four necessary conditions for deadlock.
  - What is thrashing? What are the causes of thrashing?
  - Describe swapping with diagram.
  - Compare sequential and direct access methods of a file.

**Q.5 Attempt any two.**

- a) Describe Banker's algorithm for deadlock avoidance.
- b) Consider the following reference string  
1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5  
How many page faults occur for the FIFO and Optimal page replacement algorithms assuming four frames? Which one is having minimum number of page faults?
- c) Define paging? Explain paging hardware implementation.







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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ENGINEERING MATHEMATICS – III**

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

Max. Marks: 56

- 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 04**  
 $x = t^2 + 2, y = 4t - 5$  and  $z = 2t^2 - 6t$  where  $t$  is any variable. Also determine unit tangent vector at  $t = 2$ .  
 b) Find the value of constant  $a, b$  and  $c$  for which vector **03**  
 $\vec{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$  is irrotational  
 c) Find the angle between the normals to the surface  $x^2y + z = 3$  and **03**  
 $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$

- Q.7 a)** Find the Fourier expansion of  $f(x) = 2x - x^2$  in  $(0,3)$  **05**  
**OR**  
 Find the Fourier series of  $f(x) = x^2 - 2, -2 \leq x \leq 2$  **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  

$$\int_0^{\infty} \frac{\sin wx \cdot \sin \pi w}{1 - w^2} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$$
- 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  $\frac{z^2}{(z - \frac{1}{4})(z - \frac{1}{5})}, |z| < \frac{1}{5}$
- c)** Find  $z \left\{ 3^k \sin \left( \frac{k\pi}{2} \right) \right\}, k \geq 0$
- d)** Find  $z \left\{ 4^k + \frac{1}{4^k} \right\}, k \geq 0$





Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ENGINEERING MATHEMATICS – III**

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

Max. Marks: 56

- 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 **04**  
 $x = t^2 + 2, y = 4t - 5$  and  $z = 2t^2 - 6t$  where  $t$  is any variable. Also determine unit tangent vector at  $t = 2$ .  
**b)** Find the value of constant  $a, b$  and  $c$  for which vector **03**  
 $\vec{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$  is irrotational  
**c)** Find the angle between the normals to the surface  $x^2y + z = 3$  and **03**  
 $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$

- Q.7 a)** Find the Fourier expansion of  $f(x) = 2x - x^2$  in  $(0,3)$  **05**  
**OR**  
 Find the Fourier series of  $f(x) = x^2 - 2, -2 \leq x \leq 2$  **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  

$$\int_0^{\infty} \frac{\sin wx \cdot \sin \pi w}{1 - w^2} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$$
- 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  $\frac{z^2}{(z - \frac{1}{4})(z - \frac{1}{5})}, |z| < \frac{1}{5}$
- c)** Find  $z \left\{ 3^k \sin \left( \frac{k\pi}{2} \right) \right\}, k \geq 0$
- d)** Find  $z \left\{ 4^k + \frac{1}{4^k} \right\}, k \geq 0$

Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ENGINEERING MATHEMATICS – III**

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

Max. Marks: 70

- 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**

- 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)  $\frac{1}{s} + \frac{2}{s^2-4}$
- $\frac{1}{(s+3)^2}$  is the Laplace transform of \_\_\_\_\_.  
 a)  $t e^{-3t}$                                       b)  $t^2 e^{-3t}$   
 c)  $e^{-3t}$                                       d)  $t e^{3t}$
- $L^{-1} \left\{ \frac{1}{s^2-6s+25} \right\} =$  \_\_\_\_\_.  
 a)  $\frac{e^{-3t}}{4} \sin 4t$                               b)  $\frac{e^{-3t} \cos 4t}{4}$   
 c)  $e^{-3t} \sin 4t$                               d)  $\frac{e^{3t} \sin 4t}{4}$
- 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)  $2i - 2j + 2k$
- If  $\vec{r} = xi + yj + zk$  and  $\vec{a}$  is a constant vector then  $\nabla(\vec{a} \cdot \vec{r}) =$  \_\_\_\_\_.  
 a)  $\vec{a}$     b)  $\vec{r}$   
 c)  $\vec{a} \cdot \vec{r}$                                       d) 0
- If  $z\{a^k\} = \frac{z}{z-a}$  then  $z\{k \cdot a^k\} =$  \_\_\_\_\_.  
 a)  $\frac{a}{(z-a)^2}$                                       b)  $\frac{az}{(z-a)^2}$   
 c)  $\frac{z}{(z-a)^2}$                                       d)  $\frac{-1}{(z-a)^2}$
- The inverse z-transform of  $\frac{z}{z-1}, |z| > 1$  is \_\_\_\_\_.  
 a) -1    b) 1  
 c) 0    d) K





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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ENGINEERING MATHEMATICS – III**

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

Max. Marks: 56

- 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**

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- a)  $z(p^2 - q^2) = x - y$   
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- a) Find  $L\{e^{-t} \cos^2 3t\}$   
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 c) Find the laplace transform of the periodic function defined by  

$$f(t) = \frac{kt}{T}, 0 < t < T$$
  
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**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 04**  
 $x = t^2 + 2, y = 4t - 5$  and  $z = 2t^2 - 6t$  where  $t$  is any variable. Also determine unit tangent vector at  $t = 2$ .  
 b) Find the value of constant  $a, b$  and  $c$  for which vector **03**  
 $\vec{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$  is irrotational  
 c) Find the angle between the normals to the surface  $x^2y + z = 3$  and **03**  
 $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$

- Q.7 a)** Find the Fourier expansion of  $f(x) = 2x - x^2$  in  $(0,3)$  **05**  
**OR**  
 Find the Fourier series of  $f(x) = x^2 - 2$ ,  $-2 \leq x \leq 2$  **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
- $$\int_0^{\infty} \frac{\sin wx \cdot \sin \pi w}{1 - w^2} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$$
- 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  $\frac{z^2}{(z - \frac{1}{4})(z - \frac{1}{5})}$ ,  $|z| < \frac{1}{5}$
- c)** Find  $z \left\{ 3^k \sin \left( \frac{k\pi}{2} \right) \right\}$ ,  $k \geq 0$
- d)** Find  $z \left\{ 4^k + \frac{1}{4^k} \right\}$ ,  $k \geq 0$



- 8) 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)  $\phi(xy, yz) = 0$
- 9) The value of the integral  $\int_0^{\infty} e^{-3t} \sin t dt$  is \_\_\_\_\_.
- a) 5      b)  $\frac{1}{5}$   
 c) 10      d)  $\frac{1}{10}$
- 10) 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)  $\frac{1}{s} + \frac{2}{s^2-4}$
- 11)  $\frac{1}{(s+3)^2}$  is the Laplace transform of \_\_\_\_\_.
- a)  $t e^{-3t}$       b)  $t^2 e^{-3t}$   
 c)  $e^{-3t}$       d)  $t e^{3t}$
- 12)  $L^{-1}\left\{\frac{1}{s^2-6s+25}\right\} =$  \_\_\_\_\_.
- a)  $\frac{e^{-3t}}{4} \sin 4t$       b)  $\frac{e^{-3t} \cos 4t}{4}$   
 c)  $e^{-3t} \sin 4t$       d)  $\frac{e^{3t} \sin 4t}{4}$
- 13) 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)  $2i - 2j + 2k$
- 14) If  $\vec{r} = xi + yj + zk$  and  $\vec{a}$  is a constant vector then  $\nabla(\vec{a} \cdot \vec{r}) =$  \_\_\_\_\_.
- a)  $\vec{a}$       b)  $\vec{r}$   
 c)  $\vec{a} \cdot \vec{r}$       d) 0

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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ENGINEERING MATHEMATICS – III**

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

Max. Marks: 56

- 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 04**  
 $x = t^2 + 2, y = 4t - 5$  and  $z = 2t^2 - 6t$  where  $t$  is any variable. Also determine unit tangent vector at  $t = 2$ .  
 b) Find the value of constant  $a, b$  and  $c$  for which vector **03**  
 $\vec{v} = (x + y + az)i + (bx + 3y - z)j + (3x + cy + z)k$  is irrotational  
 c) Find the angle between the normals to the surface  $x^2y + z = 3$  and **03**  
 $x \log z - y^2 + 4 = 0$  at  $(-1, 2, 1)$

- Q.7 a)** Find the Fourier expansion of  $f(x) = 2x - x^2$  in  $(0,3)$  **05**  
**OR**  
 Find the Fourier series of  $f(x) = x^2 - 2, -2 \leq x \leq 2$  **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  

$$\int_0^{\infty} \frac{\sin wx \cdot \sin \pi w}{1 - w^2} dw = \begin{cases} \frac{\pi}{2} \cdot \sin x, & |x| < \pi \\ 0, & |x| > \pi \end{cases}$$
- 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  $\frac{z^2}{(z - \frac{1}{4})(z - \frac{1}{5})}, |z| < \frac{1}{5}$
- c)** Find  $z \left\{ 3^k \sin \left( \frac{k\pi}{2} \right) \right\}, k \geq 0$
- d)** Find  $z \left\{ 4^k + \frac{1}{4^k} \right\}, k \geq 0$



- 8) Gain of an amplifier fall at high frequency due to \_\_\_\_\_.  
a) Coupling capacitor                      b) Bypass capacitor  
c) Junction capacitance                      d) Both a & b
- 9) The process of base width modulation in transistor is called as \_\_\_\_\_.  
a) Biasing                                      b) Thermal runaway  
c) Early effect                                d) Compensation
- 10) Input resistance CE amplifier is \_\_\_\_\_.  
a)  $h_{fe}$                                         b)  $H_{oe}$   
c)  $h_{ie}$                                         d)  $H_{re}$
- 11) For amplifier component values are  $h_{fe}=200$ ,  $R_L=10K\Omega$ ,  $h_{ie}=1K\Omega$ ,  $R_s=0$ , the voltage gain is \_\_\_\_\_.  
a) 2000.00                                      b) 1666.66  
c) 1768.86                                      d) None of these
- 12) The JFET is a \_\_\_\_\_.  
a) Current controlled device with high input resistance  
b) Current controlled device with low input resistance  
c) Voltage controlled device with high input resistance  
d) Voltage controlled device with low input resistance
- 13) The correct statement is \_\_\_\_\_.  
a) Monostable converts sine wave to square wave  
b) Astable converts sine wave to square wave  
c) Schmitt converts sine wave to square wave  
d) None of these
- 14) A 1 msec pulse can be stretched to 1 sec using \_\_\_\_\_.  
a) Astable multivibrator                      b) Schmitt Trigger  
c) Monostable multivibrator                      d) None of these



Seat  
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

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

Max. Marks: 56

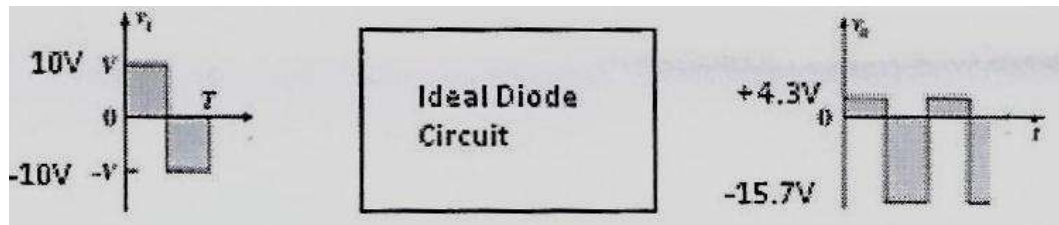
- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required  
 3) Figures to the right indicate full marks.  
 4) Use of data sheet is allowed.

**Section – I****Q.2 Attempt any four****16**

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
- Describe operation of series positive and series negative clipper. Also draw transfer characteristics curve.
- Explain any three application of Zener diode with suitable circuit diagram.
- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.

**Section – II****Q.4 Attempt any four****16**

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
- Explain drain and transfer characteristics of N channel DMOSFET.
- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with PD=250mW, hfe=250, hie=4.8K $\Omega$ , 1/hoe=1M $\Omega$ .
- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.

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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

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

Max. Marks: 70

- 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.  
 4) Use of data sheet 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) Gain of an amplifier fall at high frequency due to \_\_\_\_\_.  
 a) Coupling capacitor                      b) Bypass capacitor  
 c) Junction capacitance                      d) Both a & b
- 2) The process of base width modulation in transistor is called as \_\_\_\_\_.  
 a) Biasing                                      b) Thermal runaway  
 c) Early effect                                      d) Compensation
- 3) Input resistance CE amplifier is \_\_\_\_\_.  
 a)  $h_{fe}$                                       b)  $H_{oe}$   
 c)  $h_{ie}$                                       d)  $H_{re}$
- 4) For amplifier component values are  $h_{fe}=200$ ,  $R_L=10K\Omega$ ,  $h_{ie}=1K\Omega$ ,  $R_s=0$ , the voltage gain is \_\_\_\_\_.  
 a) 2000.00                                      b) 1666.66  
 c) 1768.86                                      d) None of these
- 5) The JFET is a \_\_\_\_\_.  
 a) Current controlled device with high input resistance  
 b) Current controlled device with low input resistance  
 c) Voltage controlled device with high input resistance  
 d) Voltage controlled device with low input resistance
- 6) The correct statement is \_\_\_\_\_.  
 a) Monostable converts sine wave to square wave  
 b) Astable converts sine wave to square wave  
 c) Schmitt converts sine wave to square wave  
 d) None of these
- 7) A 1 msec pulse can be stretched to 1 sec using \_\_\_\_\_.  
 a) Astable multivibrator                      b) Schmitt Trigger  
 c) Monostable multivibrator                      d) None of these
- 8) The load and line regulation of ideal power supply must be \_\_\_\_\_.  
 a) Zero                                      b) Infinite  
 c) Large                                      d) None



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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

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

Max. Marks: 56

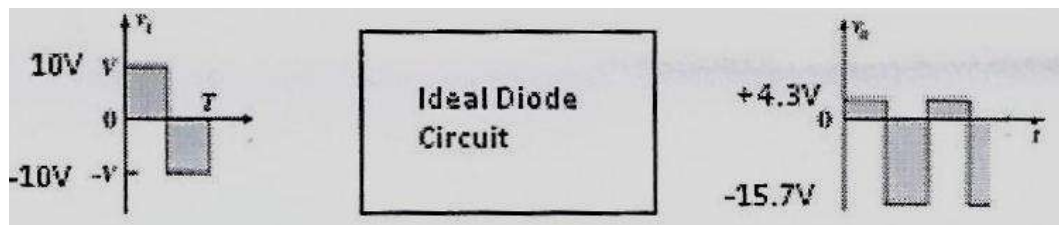
- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required  
 3) Figures to the right indicate full marks.  
 4) Use of data sheet is allowed.

**Section – I****Q.2 Attempt any four****16**

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
- Describe operation of series positive and series negative clipper. Also draw transfer characteristics curve.
- Explain any three application of Zener diode with suitable circuit diagram.
- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.

**Section – II****Q.4 Attempt any four****16**

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
- Explain drain and transfer characteristics of N channel DMOSFET.
- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
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- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.



- 8) The JFET is a \_\_\_\_\_.
- a) Current controlled device with high input resistance
  - b) Current controlled device with low input resistance
  - c) Voltage controlled device with high input resistance
  - d) Voltage controlled device with low input resistance
- 9) The correct statement is \_\_\_\_\_.
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  - d) None of these
- 10) A 1 msec pulse can be stretched to 1 sec using \_\_\_\_\_.
- a) Astable multivibrator
  - b) Schmitt Trigger
  - c) Monostable multivibrator
  - d) None of these
- 11) The load and line regulation of ideal power supply must be \_\_\_\_\_.
- a) Zero
  - b) Infinite
  - c) Large
  - d) None
- 12) If the load resistance of a capacitor filter is increases then ripple factor \_\_\_\_\_.
- a) Increases
  - b) Decreases
  - c) Remains constant
  - d) Exponentionally increases
- 13) The ripple frequency for half wave voltage doubler circuit is \_\_\_\_\_.
- a) Same as input frequency
  - b) Twice the input frequency
  - c) Half of supply frequency
  - d) Nearly equal to zero
- 14) The function of bleeder resistor in power supply is.
- a) to provide discharging path for capacitor
  - b) it improves regulation characteristics
  - c) both a & b
  - d) is same as load resistor

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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required  
 3) Figures to the right indicate full marks.  
 4) Use of data sheet is allowed.

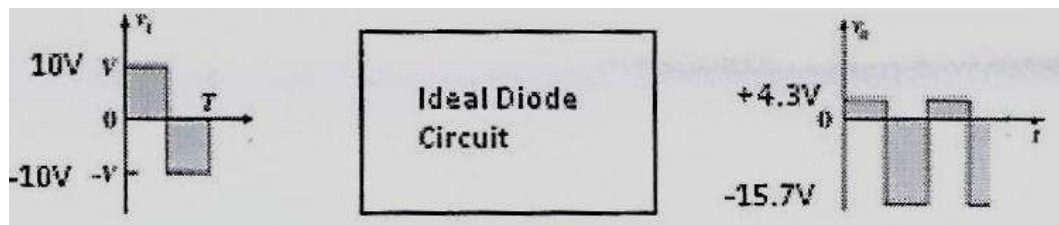
**Section – I**

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

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
- Describe operation of series positive and series negative clipper. Also draw transfer characteristics curve.
- Explain any three application of Zener diode with suitable circuit diagram.
- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.



**Section – II**

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

- Draw hybrid model for CE amplifier and explain its h parameters.
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- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

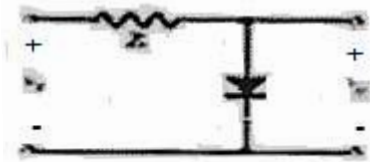
- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with  $P_D=250\text{mW}$ ,  $h_{fe}=250$ ,  $h_{ie}=4.8\text{K}\Omega$ ,  $1/h_{oe}=1\text{M}\Omega$ .
- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.





- 9) The function of bleeder resistor in power supply is.
- to provide discharging path for capacitor
  - it improves regulation characteristics
  - both a & b
  - is same as load resistor

- 10) The circuit shown below is \_\_\_\_\_.



- Positive clipper
  - Negative clipper
  - Half wave rectifier
  - Clamper
- 11) Forward drop across diode will \_\_\_\_\_ with increase in temperature.
- Increases
  - Decreases
  - Remains same
  - Becomes zero
- 12) The PIV for bridge rectifier is \_\_\_\_\_.
- $2V_m$
  - $V_m$
  - $\frac{v_m}{2}$
  - $v_m/\sqrt{2}$
- 13) Gain of an amplifier fall at high frequency due to \_\_\_\_\_.
- Coupling capacitor
  - Bypass capacitor
  - Junction capacitance
  - Both a & b
- 14) The process of base width modulation in transistor is called as \_\_\_\_\_.
- Biasing
  - Thermal runaway
  - Early effect
  - Compensation

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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – I**

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

Max. Marks: 56

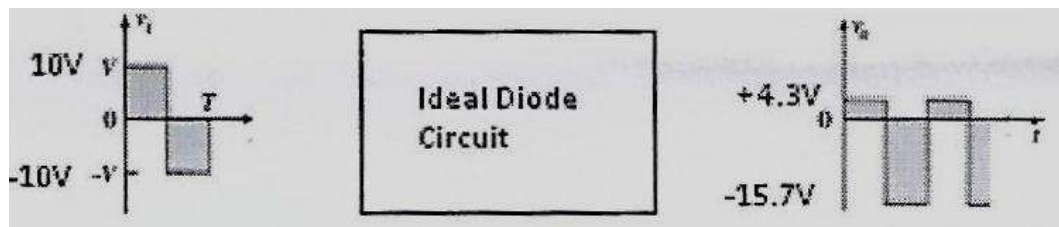
- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required  
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**Section – I****Q.2 Attempt any four****16**

- Explain VI characteristics from diode current equation. What is static and dynamic resistance of diode.
- Explain the working of full wave voltage doubler circuit.
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- Design an inductor filter to provide 100V output at 300  $\Omega$  load with peak ripple voltage not exceeding 10V. Use bridge rectifier.

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

- Explain working of LC filter. Derive an expression of its ripple factor.
- Derive an expression of Vdc, Vrms, Rectification efficiency, Ripple factor for full wave rectifier. Draw associate circuit diagram and waveforms.
- What is clamper? Describe operation of negative clamper. Draw a suitable circuit to perform function indicated.

**Section – II****Q.4 Attempt any four****16**

- Draw hybrid model for CE amplifier and explain its h parameters.
- Explain DC load line for BJT and explain significance of Q point.
- Explain drain and transfer characteristics of N channel DMOSFET.
- What is Early effect? How it affects the BJT characteristics in CB configuration.
- Explain working of Schmitt trigger with suitable circuit.

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

- Explain working of astable multivibrator with neat circuit diagram and output waveform. Derive frequency of oscillation of astable multivibrator.
- Design a single stage CE amplifier for voltage gain of 200, stability factor 5 and operating point (6V, 2mA) and frequency range 20Hz to 20KHz. Use transistor BC 547 with  $P_D=250\text{mW}$ ,  $h_{fe}=250$ ,  $h_{ie}=4.8\text{K}\Omega$ ,  $1/h_{oe}=1\text{M}\Omega$ .
- Draw a circuit diagram of Voltage divider bias circuit and explain how it stabilizes the operating point. Derive an expression of its stability factor.



- 9) Mesh Analysis is based on \_\_\_\_\_.  
 a) Kirchhoff's Voltage Law                      b) Kirchhoff's Current Law  
 c) None
- 10) For an R-L-C circuit, we get  $[D - (K1 + K2)][D - (K1 - K2)] i = 0$ . If K2 is positive, then the curve will be?  
 a) Damped    b) over damped  
 c) under damped                                      d) critically damped
- 11) The two port network is said to be symmetrical if \_\_\_\_\_.  
 a)  $Y_{11}=Y_{22}$                                       b)  $Z_{12} = Z_{21}$   
 c)  $A = C$     d) None
- 12) Inductor has a property that it doesn't allow sudden changes in \_\_\_\_\_.  
 a) Current    b) Voltages  
 c) L    d) None
- 13) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.  
 a) C    b)  $\omega RC$   
 c)  $\omega C$     d)  $1/\omega RC$
- 14) The relation between  $Z_{0\pi}, Z_1, Z_2, Z_{0T}$  is given as \_\_\_\_\_.  
 a)  $Z_{0T} = \frac{Z_1 Z_1}{Z_{0\pi}}$                                       b)  $Z_{0T} = \frac{Z_2 Z_2}{Z_{0\pi}}$   
 c)  $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$                                       d) None

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

Electronics Engineering  
NETWORK THEORY & ANALYSIS

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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

Section - I

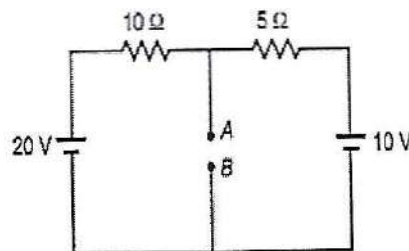
Q.2 Attempt any Four:

16

- State and Prove Maximum Power Transfer theorem with an example.
- A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

$$I_2 = -V_1 + 5V_2$$
 Find the equivalent  $\pi$ -network
- Determine the Norton's equivalent circuit at terminals AB for the circuit show below

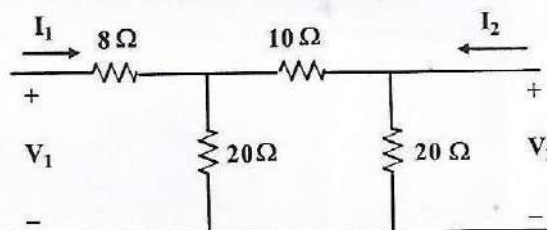


- In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu f$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

Q.3 Attempt any Two:

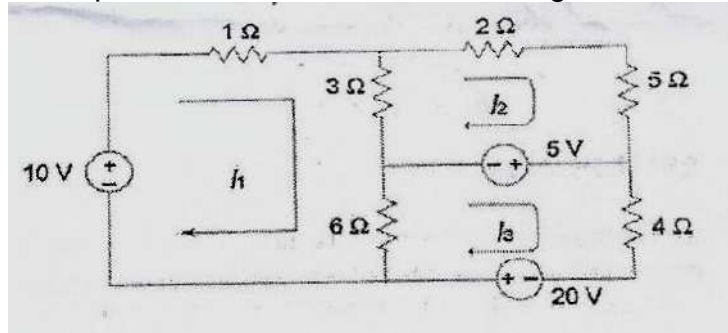
12

- Find the Z parameters for the circuit shown



- Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{X_L}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

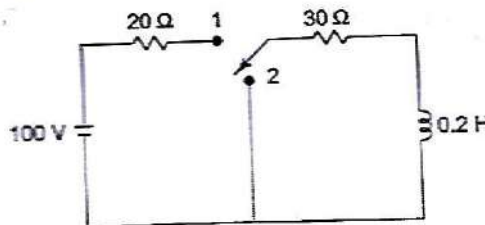


Section - II

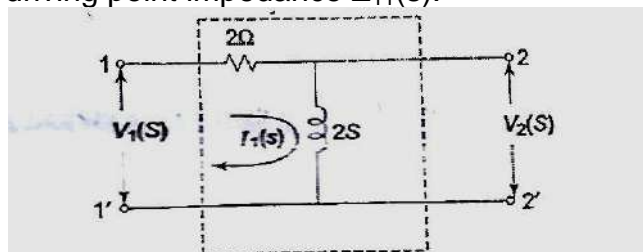
Q.4 Attempt any four:

16

- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
 c) For the network shown in figure, obtain the transfer functions  $G_{21}(s)$  and  $Z_{21}(s)$  and the driving point impedance  $Z_{11}(s)$ .



- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500\ \Omega$ .  
 e) Design a T-pad attenuator to give an attenuation of 60 dB and to work in a line of  $500\ \Omega$  impedance.

Q.5 Attempt any two.

12

- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
 c) Explain the Routh Criteria for stability. For the given denominator polynomial of the network function, verify the stability of the network function using Routh criteria.

$$Q(s) = s^4 + s^3 + 2s^2 + 2s + 12$$

Seat No.	
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**S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**NETWORK THEORY & ANALYSIS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
 2) All questions are compulsory.  
 3) Assume the suitable 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 s-domain equivalent of the inductor reduces to an inductor with impedance?
  - a) L
  - b) SL
  - c) S<sup>2</sup>L
  - d) S<sup>3</sup>L
- 2) Mesh Analysis is based on \_\_\_\_\_.
  - a) Kirchhoff's Voltage Law
  - b) Kirchhoff's Current Law
  - c) None
- 3) For an R-L-C circuit, we get  $[D - (K_1 + K_2)][D - (K_1 - K_2)] i = 0$ . If K<sub>2</sub> is positive, then the curve will be?
  - a) Damped
  - b) over damped
  - c) under damped
  - d) critically damped
- 4) The two port network is said to be symmetrical if \_\_\_\_\_.
  - a)  $Y_{11} = Y_{22}$
  - b)  $Z_{12} = Z_{21}$
  - c)  $A = C$
  - d) None
- 5) Inductor has a property that it doesn't allow sudden changes in \_\_\_\_\_.
  - a) Current
  - b) Voltages
  - c) L
  - d) None
- 6) If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.
  - a) C
  - b)  $\omega RC$
  - c)  $\omega C$
  - d)  $1/\omega RC$
- 7) The relation between  $Z_{0\pi}, Z_1, Z_2, Z_{0T}$  is given as \_\_\_\_\_.
  - a)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - b)  $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - c)  $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$
  - d) None
- 8) The time constant of a series RC circuit is \_\_\_\_\_.
  - a) RC
  - b)  $\frac{C}{R}$
  - c)  $\frac{R}{C}$
  - d)  $e^{-RLC}$
- 9) The function is said to be having simple poles and zeros only if \_\_\_\_\_.
  - a) The poles are not repeated
  - b) The zeros are not repeated
  - c) The poles and zeros are not repeated
  - d) none of the above

- 10) Cascade connection of LPF with cutoff frequency  $f_1$  and HPF with cutoff frequency  $f_2$  gives band pass filter if \_\_\_\_\_.
- a)  $f_1 < f_2$
  - b)  $f_1 > f_2$
  - c)  $f_1 = f_2$
  - d) none of the above
- 11) The Z parameters  $Z_{11}$  and  $Z_{21}$  are obtained by \_\_\_\_\_.
- a) by shorting input terminals
  - b) by opening input terminals
  - c) by shorting output terminals
  - d) by opening output terminals
- 12) If the degree of the node is two, then it indicates that two branches are incident at node and these are in \_\_\_\_\_.
- a) Series
  - b) Parallel
  - c) Both a) & b)
  - d) None
- 13) Maximum power is transferred when the load impedance is equal to \_\_\_\_.
- a) Source impedance
  - b) Zero
  - c) Half of Source Impedance
  - d) None
- 14) If the lower cutoff frequency is 2400 Hz and the upper cut off frequency is 2800 Hz, what is the bandwidth?
- a) 400Hz
  - b) 2400Hz
  - c) 2800Hz
  - d) 5200Hz



Seat No.	
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Set	Q
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**S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019  
Electronics Engineering  
NETWORK THEORY & ANALYSIS**

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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

**Section - I**

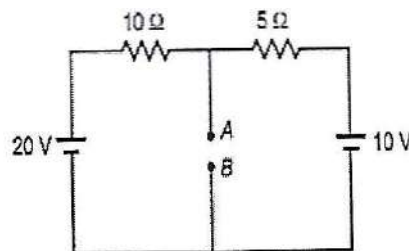
**Q.2 Attempt any Four:**

16

- State and Prove Maximum Power Transfer theorem with an example.
- A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

$$I_2 = -V_1 + 5V_2$$
 Find the equivalent  $\pi$ -network
- Determine the Norton's equivalent circuit at terminals AB for the circuit show below

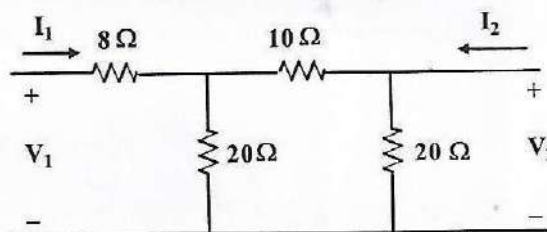


- In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu f$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

**Q.3 Attempt any Two:**

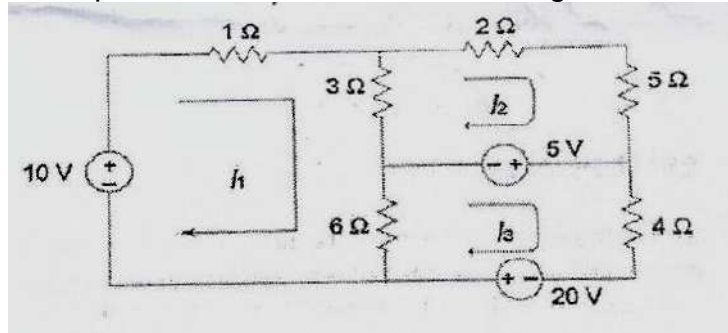
12

- Find the Z parameters for the circuit shown



- Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{XL}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

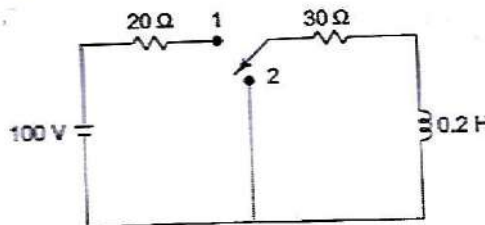


**Section - II**

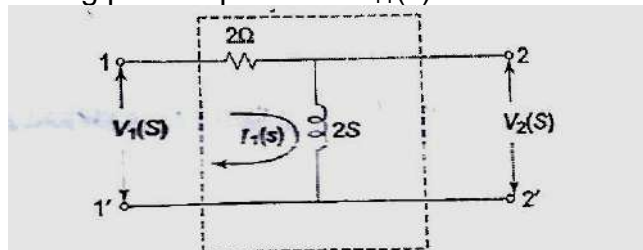
**Q.4 Attempt any four:**

16

- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
 c) For the network shown in figure, obtain the transfer functions  $G_{21}(s)$  and  $Z_{21}(s)$  and the driving point impedance  $Z_{11}(s)$ .



- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500 \Omega$ .  
 e) Design a T -pad attenuator to give an attenuation of 60 dB and to work in a line of  $500 \Omega$  impedance.

**Q.5 Attempt any two.**

12

- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
 c) Explain the Routh Criteria for stability. For the given denominator polynomial of the network function, verify the stability of the network function using Routh criteria.

$$Q(S) = S^4 + S^3 + 2S^2 + 2S + 12$$





Seat  
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**S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019**  
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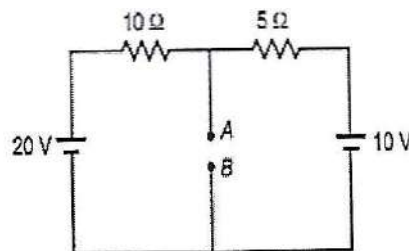
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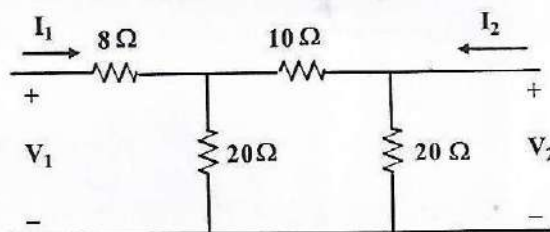
$$I_2 = -V_1 + 5V_2$$
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 d) Determine the Norton's equivalent circuit at terminals AB for the circuit show below



- e) In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu f$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

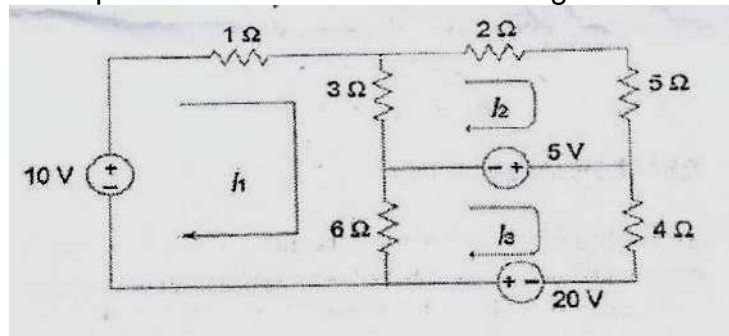
**Q.3 Attempt any Two:****12**

- a) Find the Z parameters for the circuit shown



- b) Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{X_L}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

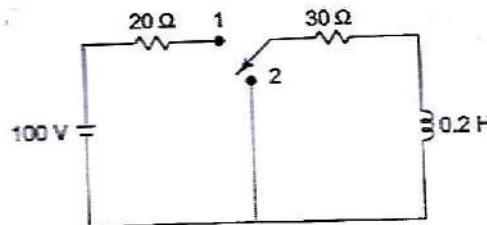


**Section - II**

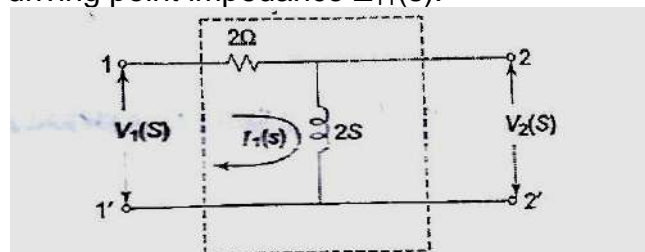
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- a) Explain in detail the DC response of series RLC circuit.  
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$$Q(s) = s^4 + s^3 + 2s^2 + 2s + 12$$

Seat No.	
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**S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**NETWORK THEORY & ANALYSIS**

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

Max. Marks: 70

- 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**

- For an R-L-C circuit, we get  $[D - (K_1 + K_2)][D - (K_1 - K_2)] i = 0$ . If  $K_2$  is positive, then the curve will be?
  - Damped
  - over damped
  - under damped
  - critically damped
- The two port network is said to be symmetrical if \_\_\_\_\_.
  - $Y_{11}=Y_{22}$
  - $Z_{12} = Z_{21}$
  - $A = C$
  - None
- Inductor has a property that it doesn't allow sudden changes in \_\_\_\_\_.
  - Current
  - Voltages
  - L
  - None
- If a series circuit RLC circuit, the quality factor is defined as \_\_\_\_\_.
  - C
  - $\omega RC$
  - $\omega C$
  - $1/\omega RC$
- The relation between  $Z_{0\pi}, Z_1, Z_2, Z_{0T}$  is given as \_\_\_\_\_.
  - $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - $Z_{0T} = \frac{Z_1 Z_2}{Z_{0\pi}}$
  - $Z_{0\pi} = \frac{Z_1 Z_2}{Z_{0T}}$
  - None
- The time constant of a series RC circuit is \_\_\_\_\_.
  - RC
  - $\frac{C}{R}$
  - $\frac{R}{C}$
  - $e^{-RLC}$
- The function is said to be having simple poles and zeros only if \_\_\_\_\_.
  - The poles are not repeated
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  - none of the above
- Cascade connection of LPF with cutoff frequency  $f_1$  and HPF with cutoff frequency  $f_2$  gives band pass filter if \_\_\_\_\_.
  - $f_1 < f_2$
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  - none of the above
- The Z parameters  $Z_{11}$  and  $Z_{21}$  are obtained by \_\_\_\_\_.
  - by shorting input terminals
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- 10) If the degree of the node is two, then it indicates that two branches are incident at node and these are in \_\_\_\_\_.
- |                 |             |
|-----------------|-------------|
| a) Series       | b) Parallel |
| c) Both a) & b) | d) None     |
- 11) Maximum power is transferred when the load impedance is equal to \_\_\_\_.
- |                             |         |
|-----------------------------|---------|
| a) Source impedance         | b) Zero |
| c) Half of Source Impedance | d) None |
- 12) If the lower cutoff frequency is 2400 Hz and the upper cut off frequency is 2800 Hz, what is the bandwidth?
- |           |           |
|-----------|-----------|
| a) 400Hz  | b) 2400Hz |
| c) 2800Hz | d) 5200Hz |
- 13) The s-domain equivalent of the inductor reduces to an inductor with impedance?
- |           |           |
|-----------|-----------|
| a) L      | b) SL     |
| c) $S^2L$ | d) $S^3L$ |
- 14) Mesh Analysis is based on \_\_\_\_\_.
- |                            |                            |
|----------------------------|----------------------------|
| a) Kirchhoff's Voltage Law | b) Kirchhoff's Current Law |
| c) None                    |                            |



Seat  
No.

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

**Electronics Engineering**  
**NETWORK THEORY & ANALYSIS**

Day & Date: Thursday, 12-12-2019  
Time: 10.00 AM To 01.00 PM

Max. Marks: 56

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

**Section - I**

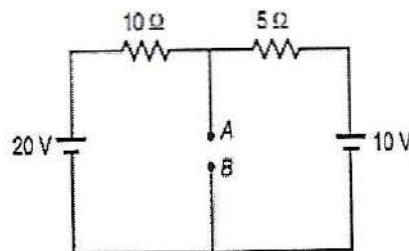
**Q.2 Attempt any Four:**

16

- a) State and Prove Maximum Power Transfer theorem with an example.
- b) A series RLC circuit is supplied at 220v, 50 Hz. At resonance the voltage across the capacitor is 550 V and current  $I=1A$ . Determine the circuit constants.
- c) The port currents of a two port network are given by  

$$I_1 = 2.5V_1 - V_2$$

$$I_2 = -V_1 + 5V_2$$
 Find the equivalent  $\pi$ -network
- d) Determine the Norton's equivalent circuit at terminals AB for the circuit show below

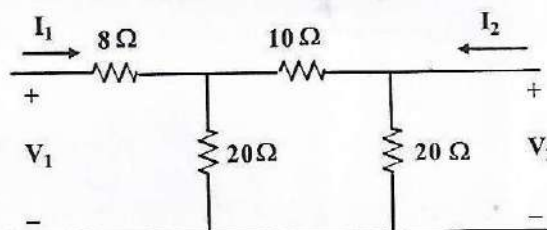


- e) In a series RLC circuit a maximum current of 0.1A flows through circuit when the capacitor is  $5\mu f$ , inductor is 0.1H with a fixed frequency at voltage of 5V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency.

**Q.3 Attempt any Two:**

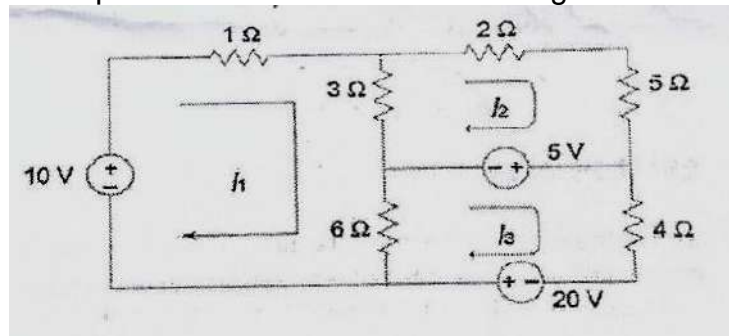
12

- a) Find the Z parameters for the circuit shown



- b) Prove that bandwidth of series RLC circuit is  $\frac{R}{2\pi L}$ . Also prove that  $Q = \frac{XL}{R}$

- c) Write the mesh equations for the circuit show in Fig 2.31.

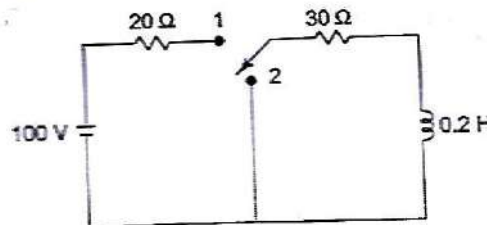


Section - II

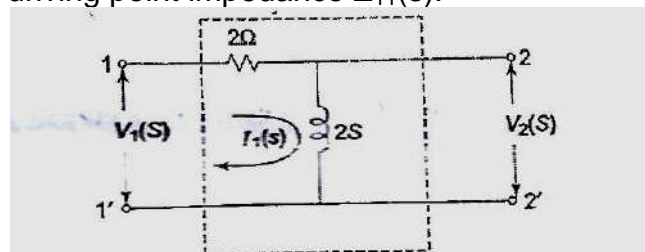
Q.4 Attempt any four:

16

- a) For the circuit shown, find the current equation when the switch is changed from position 1 to position 2 at  $t=0$



- b) Enlist the necessary conditions for driving point function.  
 c) For the network shown in figure, obtain the transfer functions  $G_{21}(s)$  and  $Z_{21}(s)$  and the driving point impedance  $Z_{11}(s)$ .



- d) Design a T section low pass filter having a cut-off frequency of 2kHz to operate with a terminated load resistance of  $500 \Omega$ .  
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Q.5 Attempt any two.

12

- a) Explain in detail the DC response of series RLC circuit.  
 b) Derive the equations for  $L_1$ ,  $C_1$ ,  $L_2$ , and  $C_2$  of Band Pass Filter.  
 c) Explain the Routh Criteria for stability. For the given denominator polynomial of the network function, verify the stability of the network function using Routh criteria.

$$Q(s) = s^4 + s^3 + 2s^2 + 2s + 12$$

Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) According to Boolean algebra  $(A+AB)$  equals \_\_\_\_\_.
  - a) A
  - b) B
  - c) AB
  - d) A+B
- 2) A Four Variable K map has a \_\_\_\_\_.
  - a) 8 min-terms
  - b) 16 min-terms
  - c) 32 min-terms
  - d) None of these
- 3) Each term in standard POS form is called as \_\_\_\_\_.
  - a) Minterm
  - b) Maxterm
  - c) Don't care
  - d) Literals
- 4) The NAND-NAND realization is equivalent to \_\_\_\_\_.
  - a) AND-NOT realization
  - b) AND-OR realization
  - c) OR-AND realization
  - d) NOT-OR realization
- 5) 8421 code is \_\_\_\_\_.
  - a) self complimenting code
  - b) weighted code
  - c) non weighted code
  - d) alphanumeric code
- 6) The following code is not a BCD code \_\_\_\_\_.
  - a) Gray code
  - b) XS-3 code
  - c) 8421 code
  - d) all of the above
- 7) A TTL circuit acts as a current source in the \_\_\_\_\_.
  - a) low state
  - b) high state
  - c) high impedance state
  - d) none of these
- 8) A flip flop has \_\_\_\_\_ states.
  - a) Four
  - b) One
  - c) Two
  - d) Three
- 9) The functional difference between S-R flip-flop and J-K flip flop is that \_\_\_\_\_.
  - a) J-K flip-flop is faster than S-R flip-flop
  - b) J-K flip-flop has feedback path
  - c) J-K flip-flop accepts both inputs 1
  - d) J-K flip flop does not require external clock

- 10) The digital circuit that can count clock pulse is called as \_\_\_\_\_.  
a) Latch  
b) Counter  
c) Shift register  
d) Trigger
- 11) A PLA is \_\_\_\_\_.  
a) a LSI device  
b) a MSI device  
c) a SSI Device  
d) a discrete Device
- 12) A combinational PLD with a fixed AND array and programmable OR array is called \_\_\_\_\_.  
a) PLD  
b) PROM  
c) PAL  
d) PLA
- 13) The output of the Moore machine is the function of \_\_\_\_\_.  
a) next state  
b) present inputs  
c) present state and present inputs  
d) present state
- 14) A demultiplexer can be used to realize a \_\_\_\_\_.  
a) Counter  
b) Shift register  
c) Combination circuit  
d) Display system

Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10
- b) Design and implement full subtractor using a 4:1 multiplexer.
- c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS
- d) Derive a code table for BCD code 5421 which satisfies self complementary property.
- d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
- b) Design and implement 1:8 de-multiplexer using NAND gates only.
- c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

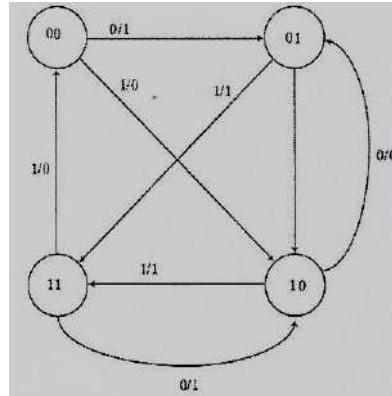
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
- b) Design a 3-bit ripple counter. What is the modulus of the counter?
- c) Design a D flip-flop using T flip-flop.
- d) Draw and explain a 4-bit twisted ring counter using shift register.
- e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.



Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) A flip flop has \_\_\_\_\_ states.
 

a) Four	b) One
c) Two	d) Three
- 2) The functional difference between S-R flip-flop and J-K flip flop is that \_\_\_\_\_.
  - a) J-K flip-flop is faster than S-R flip-flop
  - b) J-K flip-flop has feedback path
  - c) J-K flip-flop accepts both inputs 1
  - d) J-K flip flop does not require external clock
- 3) The digital circuit that can count clock pulse is called as \_\_\_\_\_.
 

a) Latch	b) Counter
c) Shift register	d) Trigger
- 4) A PLA is \_\_\_\_\_.
 

a) a LSI device	b) a MSI device
c) a SSI Device	d) a discrete Device
- 5) A combinational PLD with a fixed AND array and programmable OR array is called \_\_\_\_\_.
 

a) PLD	b) PROM
c) PAL	d) PLA
- 6) The output of the Moore machine is the function of \_\_\_\_\_.
  - a) next state
  - b) present inputs
  - c) present state and present inputs
  - d) present state
- 7) A demultiplexer can be used to realize a \_\_\_\_\_.
 

a) Counter	b) Shift register
c) Combination circuit	d) Display system
- 8) According to Boolean algebra  $(A+AB)$  equals \_\_\_\_\_.
 

a) A	b) B
c) AB	d) A+B
- 9) A Four Variable K map has a \_\_\_\_\_.
 

a) 8 min-terms	b) 16 min-terms
c) 32 min-terms	d) None of these





Seat No.	
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Set **Q**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10
- b) Design and implement full subtractor using a 4:1 multiplexer.
- c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS
- d) Derive a code table for BCD code 5421 which satisfies self complementary property.
- d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
- b) Design and implement 1:8 de-multiplexer using NAND gates only.
- c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

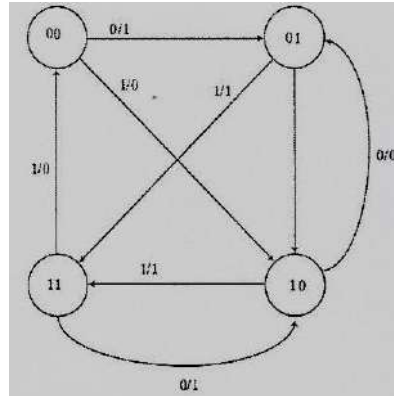
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
- b) Design a 3-bit ripple counter. What is the modulus of the counter?
- c) Design a D flip-flop using T flip-flop.
- d) Draw and explain a 4-bit twisted ring counter using shift register.
- e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.



Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 70

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

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) 8421 code is \_\_\_\_\_.
  - a) self complimenting code
  - b) weighted code
  - c) non weighted code
  - d) alphanumeric code
- 2) The following code is not a BCD code \_\_\_\_\_.
  - a) Gray code
  - b) XS-3 code
  - c) 8421 code
  - d) all of the above
- 3) A TTL circuit acts as a current source in the \_\_\_\_\_.
  - a) low state
  - b) high state
  - c) high impedance state
  - d) none of these
- 4) A flip flop has \_\_\_\_\_ states.
  - a) Four
  - b) One
  - c) Two
  - d) Three
- 5) The functional difference between S-R flip-flop and J-K flip flop is that \_\_\_\_\_.
  - a) J-K flip-flop is faster than S-R flip-flop
  - b) J-K flip-flop has feedback path
  - c) J-K flip-flop accepts both inputs 1
  - d) J-K flip flop does not require external clock
- 6) The digital circuit that can count clock pulse is called as \_\_\_\_\_.
  - a) Latch
  - b) Counter
  - c) Shift register
  - d) Trigger
- 7) A PLA is \_\_\_\_\_.
  - a) a LSI device
  - b) a MSI device
  - c) a SSI Device
  - d) a discrete Device
- 8) A combinational PLD with a fixed AND array and programmable OR array is called \_\_\_\_\_.
  - a) PLD
  - b) PROM
  - c) PAL
  - d) PLA
- 9) The output of the Moore machine is the function of \_\_\_\_\_.
  - a) next state
  - b) present inputs
  - c) present state and present inputs
  - d) present state



Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10
- b) Design and implement full subtractor using a 4:1 multiplexer.
- c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS
- d) Derive a code table for BCD code 5421 which satisfies self complementary property.
- d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
- b) Design and implement 1:8 de-multiplexer using NAND gates only.
- c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

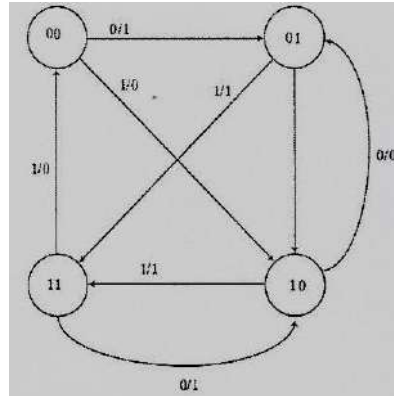
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
- b) Design a 3-bit ripple counter. What is the modulus of the counter?
- c) Design a D flip-flop using T flip-flop.
- d) Draw and explain a 4-bit twisted ring counter using shift register.
- e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.









Seat No.	
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Set **S**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL LOGIC DESIGN**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Convert the following numbers to indicated bases:  
 1)  $(1010.1101)_2$  to base 8      2)  $(DBCA.B)_{16}$  to base 10
- b) Design and implement full subtractor using a 4:1 multiplexer.
- c) Define the following terms with examples.  
 1) Minterm, Maxterm      2) Canonical SOP, Canonical POS
- d) Derive a code table for BCD code 5421 which satisfies self complementary property.
- d) Write both SOP and POS expressions for a two-input EXNOR gate and a two-input OR gate.

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

- a) Implement the following Boolean function  $F$ , using the two-level forms of logic (a) NANDAND, (b) AND-NOR, (c) OR-NAND, and (d) NOR-OR:  

$$F(A, B, C, D) = \sum m(0, 1, 2, 8, 11) + d(3, 8, 15)$$
- b) Design and implement 1:8 de-multiplexer using NAND gates only.
- c) Design and implement an odd parity generator for 3 bit information using an 8:1 multiplexer and a parity checker for the same using a 16:1 multiplexer.

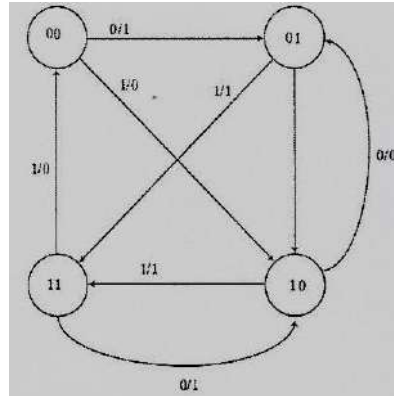
**Section – II**

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

- a) Design a 2 bit gray to binary code converter using a PAL.
- b) Design a 3-bit ripple counter. What is the modulus of the counter?
- c) Design a D flip-flop using T flip-flop.
- d) Draw and explain a 4-bit twisted ring counter using shift register.
- e) What is a shift register? Explain SISO shift register in detail.

**Q.5 Attempt any two.**

- Design a mod 6 synchronous up counter using T flip-flop. Draw neat logic diagram and waveforms.
- A JK flip-flop has four operations no change, clear to 0, set to 1 and complement, when inputs J and K are 00, 01, 10 and 11 respectively. Design a JK flip-flop using SR flip-flop.
- Design a sequential circuit specified by state diagram shown using D flip-flops.





- 8) To obtain a prefix expression, which of the tree traversals is used?  
a) Level-order traversal                      b) Pre-order traversal  
c) Post-order traversal                        d) In-order traversal
- 9) Adjacency matrix of all graphs are symmetric.  
a) False    b) True
- 10) What is the best case for linear search?  
a)  $O(n \log n)$                                       b)  $O(\log n)$   
c)  $O(n)$     d)  $O(1)$
- 11) What is the search complexity in Hashing?  
a)  $O(n)$     b)  $O(\log n)$   
c)  $O(n \log n)$                                       d)  $O(1)$
- 12) What is the advantage of bubble sort over other sorting techniques?  
a) It is faster  
b) Consumes less memory  
c) Detects whether the input is already sorted  
d) All of the mentioned
- 13) For the adjacency matrix of a directed graph the row sum is the \_\_\_\_\_ degree and the column sum is the \_\_\_\_\_ degree.  
a) in, out    b) out, in  
c) in, total    d) total, out
- 14) In a binary search tree, which of the following traversals would print the numbers in the ascending order?  
a) Level-order traversal                        b) Pre-order traversal  
c) Post-order traversal                          d) In-order traversal

Seat No.	
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Set **P**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

- 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**
- Write a short note on deque.
  - Define stack. Explain the push and pop operations of stack with C routine.
  - Describe the addition of two polynomials using linked list.
  - Write a program in 'C' to calculate the factorial of a number using recursion
  - Evaluate the following postfix expression : 1, 2, 3, \*, +, 4, -
- Q.3 Attempt any two. 12**
- Write a program in 'C' to implement stack using array.
  - Explain the dynamic storage allocation for recursion using flowchart
  - Write short notes on:
    - Avail list
    - Doubly linked list

**Section – II**

- Q.4 Attempt any four. 16**
- How to represent a graph using adjacency linked list?
  - Explain insertion sort. Sort the following sequence in ascending order using insertion sort.  
14, 33, 27, 10, 35, 19, 42, 44
  - Define hashing. Explain the following hash functions with example.
    - Mid square method
    - Folding method
  - Compare binary search and linear search.
  - Explain the different tree traversal method.
- Q.5 Attempt any two: 12**
- Explain any one graph traversal method with flowchart and example.
  - What is hash collision? Explain open addressing technique in detail.
  - 1) Define the following terms:
    - Depth of the tree
    - Ancestor node
    - Descendent node
  - 2) Explain the threaded binary trees

Seat No.	
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Set **Q**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 70

- 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) To obtain a prefix expression, which of the tree traversals is used?
  - a) Level-order traversal
  - b) Pre-order traversal
  - c) Post-order traversal
  - d) In-order traversal
- 2) Adjacency matrix of all graphs are symmetric.
  - a) False
  - b) True
- 3) What is the best case for linear search?
  - a)  $O(n \log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(1)$
- 4) What is the search complexity in Hashing?
  - a)  $O(n)$
  - b)  $O(\log n)$
  - c)  $O(n \log n)$
  - d)  $O(1)$
- 5) What is the advantage of bubble sort over other sorting techniques?
  - a) It is faster
  - b) Consumes less memory
  - c) Detects whether the input is already sorted
  - d) All of the mentioned
- 6) For the adjacency matrix of a directed graph the row sum is the \_\_\_\_\_ degree and the column sum is the \_\_\_\_\_ degree.
  - a) in, out
  - b) out, in
  - c) in, total
  - d) total, out
- 7) In a binary search tree, which of the following traversals would print the numbers in the ascending order?
  - a) Level-order traversal
  - b) Pre-order traversal
  - c) Post-order traversal
  - d) In-order traversal
- 8) The result of evaluating the postfix expression 5, 4, 6, +, \*, 4, 9, 3, /, +, \* is \_\_\_\_\_.
  - a) 600
  - b) 350
  - c) 650
  - d) 588
- 9) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?
  - a) ABDC
  - b) DCBA
  - c) DCAB
  - d) ABCD

- 10) A linear collection of data elements where the linear node is given by means of pointer is called \_\_\_\_\_.
- a) Linked list
  - b) Node list
  - c) Primitive list
  - d) None of the mentioned
- 11) Recursion is similar to which of the following \_\_\_\_\_.
- a) Switch Case
  - b) Loop
  - c) If-else
  - d) None of the mentioned
- 12) The data structure required to check whether an expression contains balanced parenthesis is \_\_\_\_\_.
- a) Stack
  - b) Queue
  - c) Array
  - d) Tree
- 13) In linked list implementation of a queue, from where is the item deleted?
- a) At the tail of the link list
  - b) At the centre position in the link list
  - c) At the head of link list
  - d) None of the mentioned
- 14) What is the complexity of searching for a particular element in a Singly Linked List?
- a)  $n \log n$
  - b)  $O(1)$
  - c)  $\log n$
  - d)  $O(n)$

Seat No.	
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Set **Q**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

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

- Q.2 Attempt any four. 16**
- a) Write a short note on deque.
  - b) Define stack. Explain the push and pop operations of stack with C routine.
  - c) Describe the addition of two polynomials using linked list.
  - d) Write a program in 'C' to calculate the factorial of a number using recursion
  - e) Evaluate the following postfix expression : 1, 2, 3, \*, +, 4, -
- Q.3 Attempt any two. 12**
- a) Write a program in 'C' to implement stack using array.
  - b) Explain the dynamic storage allocation for recursion using flowchart
  - c) Write short notes on:
    - 1) Avail list
    - 2) Doubly linked list

**Section – II**

- Q.4 Attempt any four. 16**
- a) How to represent a graph using adjacency linked list?
  - b) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.  
14, 33, 27, 10, 35, 19, 42, 44
  - c) Define hashing. Explain the following hash functions with example.
    - 1) Mid square method
    - 2) Folding method
  - d) Compare binary search and linear search.
  - e) Explain the different tree traversal method.
- Q.5 Attempt any two: 12**
- a) Explain any one graph traversal method with flowchart and example.
  - b) What is hash collision? Explain open addressing technique in detail.
  - c) 1) Define the following terms:
    - i) Depth of the tree
    - ii) Ancestor node
    - iii) Descendent node
  - 2) Explain the threaded binary trees





- 9) For the adjacency matrix of a directed graph the row sum is the \_\_\_\_\_ degree and the column sum is the \_\_\_\_\_ degree.
- |              |               |
|--------------|---------------|
| a) in, out   | b) out, in    |
| c) in, total | d) total, out |
- 10) In a binary search tree, which of the following traversals would print the numbers in the ascending order?
- |                          |                        |
|--------------------------|------------------------|
| a) Level-order traversal | b) Pre-order traversal |
| c) Post-order traversal  | d) In-order traversal  |
- 11) The result of evaluating the postfix expression 5, 4, 6, +, \*, 4, 9, 3, /, +, \* is \_\_\_\_\_.
- |        |        |
|--------|--------|
| a) 600 | b) 350 |
| c) 650 | d) 588 |
- 12) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?
- |         |         |
|---------|---------|
| a) ABDC | b) DCBA |
| c) DCAB | d) ABCD |
- 13) A linear collection of data elements where the linear node is given by means of pointer is called \_\_\_\_\_.
- |                   |                          |
|-------------------|--------------------------|
| a) Linked list    | b) Node list             |
| c) Primitive list | d) None of the mentioned |
- 14) Recursion is similar to which of the following \_\_\_\_\_.
- |                |                          |
|----------------|--------------------------|
| a) Switch Case | b) Loop                  |
| c) If-else     | d) None of the mentioned |

Seat No.	
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Set **R**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four. 16**
- a) Write a short note on deque.
  - b) Define stack. Explain the push and pop operations of stack with C routine.
  - c) Describe the addition of two polynomials using linked list.
  - d) Write a program in 'C' to calculate the factorial of a number using recursion
  - e) Evaluate the following postfix expression : 1, 2, 3, \*, +, 4, -
- Q.3 Attempt any two. 12**
- a) Write a program in 'C' to implement stack using array.
  - b) Explain the dynamic storage allocation for recursion using flowchart
  - c) Write short notes on:
    - 1) Avail list
    - 2) Doubly linked list

**Section – II**

- Q.4 Attempt any four. 16**
- a) How to represent a graph using adjacency linked list?
  - b) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.  
14, 33, 27, 10, 35, 19, 42, 44
  - c) Define hashing. Explain the following hash functions with example.
    - 1) Mid square method
    - 2) Folding method
  - d) Compare binary search and linear search.
  - e) Explain the different tree traversal method.
- Q.5 Attempt any two: 12**
- a) Explain any one graph traversal method with flowchart and example.
  - b) What is hash collision? Explain open addressing technique in detail.
  - c) 1) Define the following terms:
    - i) Depth of the tree
    - ii) Ancestor node
    - iii) Descendent node
  - 2) Explain the threaded binary trees

Seat No.	
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**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 70

- 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) What is the best case for linear search?
  - a)  $O(n \log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(1)$
- 2) What is the search complexity in Hashing?
  - a)  $O(n)$
  - b)  $O(\log n)$
  - c)  $O(n \log n)$
  - d)  $O(1)$
- 3) What is the advantage of bubble sort over other sorting techniques?
  - a) It is faster
  - b) Consumes less memory
  - c) Detects whether the input is already sorted
  - d) All of the mentioned
- 4) For the adjacency matrix of a directed graph the row sum is the \_\_\_\_\_ degree and the column sum is the \_\_\_\_\_ degree.
  - a) in, out
  - b) out, in
  - c) in, total
  - d) total, out
- 5) In a binary search tree, which of the following traversals would print the numbers in the ascending order?
  - a) Level-order traversal
  - b) Pre-order traversal
  - c) Post-order traversal
  - d) In-order traversal
- 6) The result of evaluating the postfix expression 5, 4, 6, +, \*, 4, 9, 3, /, +, \* is \_\_\_\_\_.
  - a) 600
  - b) 350
  - c) 650
  - d) 588
- 7) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?
  - a) ABDC
  - b) DCBA
  - c) DCAB
  - d) ABCD
- 8) A linear collection of data elements where the linear node is given by means of pointer is called \_\_\_\_\_.
  - a) Linked list
  - b) Node list
  - c) Primitive list
  - d) None of the mentioned

- 9) Recursion is similar to which of the following \_\_\_\_\_.
- a) Switch Case
  - b) Loop
  - c) If-else
  - d) None of the mentioned
- 10) The data structure required to check whether an expression contains balanced parenthesis is \_\_\_\_\_.
- a) Stack
  - b) Queue
  - c) Array
  - d) Tree
- 11) In linked list implementation of a queue, from where is the item deleted?
- a) At the tail of the link list
  - b) At the centre position in the link list
  - c) At the head of link list
  - d) None of the mentioned
- 12) What is the complexity of searching for a particular element in a Singly Linked List?
- a)  $n \log n$
  - b)  $O(1)$
  - c)  $\log n$
  - d)  $O(n)$
- 13) To obtain a prefix expression, which of the tree traversals is used?
- a) Level-order traversal
  - b) Pre-order traversal
  - c) Post-order traversal
  - d) In-order traversal
- 14) Adjacency matrix of all graphs are symmetric.
- a) False
  - b) True

Seat No.	
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Set **S**

**S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DATA STRUCTURES**

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

Max. Marks: 56

- 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) Write a short note on deque.
  - b) Define stack. Explain the push and pop operations of stack with C routine.
  - c) Describe the addition of two polynomials using linked list.
  - d) Write a program in 'C' to calculate the factorial of a number using recursion
  - e) Evaluate the following postfix expression : 1, 2, 3, \*, +, 4, -
- Q.3 Attempt any two. 12**
- a) Write a program in 'C' to implement stack using array.
  - b) Explain the dynamic storage allocation for recursion using flowchart
  - c) Write short notes on:
    - 1) Avail list
    - 2) Doubly linked list

**Section – II**

- Q.4 Attempt any four. 16**
- a) How to represent a graph using adjacency linked list?
  - b) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.  
14, 33, 27, 10, 35, 19, 42, 44
  - c) Define hashing. Explain the following hash functions with example.
    - 1) Mid square method
    - 2) Folding method
  - d) Compare binary search and linear search.
  - e) Explain the different tree traversal method.
- Q.5 Attempt any two: 12**
- a) Explain any one graph traversal method with flowchart and example.
  - b) What is hash collision? Explain open addressing technique in detail.
  - c) 1) Define the following terms:
    - i) Depth of the tree
    - ii) Ancestor node
    - iii) Descendent node
  - 2) Explain the threaded binary trees

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Set P
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**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 70

- Instructions:** 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the option and rewrite the sentence. 14**

- 1) The upper 3dB frequency for N identical stages is given by \_\_\_\_\_.
 

a) $f_{H(n)} = f_H \sqrt{2^n + 1}$	b) $f_{H(n)} = f_H \sqrt{2^n - 1}$
c) $f_{H(n)} = f_H \sqrt{1 - 2^{\frac{1}{n}}}$	d) $f_{H(n)} = \frac{f_H}{\sqrt{\frac{1}{2^{n+1}}}}$
- 2) A multistage amplifier employs three stages each of which has voltage gain of 50, then overall gain of amplifier is \_\_\_\_\_.
 

a) 101.93dB	b) 50.96dB
c) 509.6dB	d) 1010.96dB
- 3) CLASS AB operation is often used in large signal amplifier in order to \_\_\_\_\_.
  - a) Get maximum efficiency
  - b) Remove even harmonics
  - c) Overcome cross over distortion
  - d) Reduce collector dissipation
- 4) The efficiency of CLASS C power amplifier is \_\_\_\_\_.
 

a) 100%	b) 78.5 %
c) 50% to 78.5%	d) 78.5 %
- 5) In CLASS A Power amplifier collector current in the output circuit flows for \_\_\_\_\_.
  - a)  $180^\circ$
  - b)  $360^\circ$
  - c) less than  $180^\circ$
  - d) greater than  $180^\circ$  & less than  $360^\circ$
- 6) If we employ voltage series feedback in amplifier then \_\_\_\_\_.
  - a) Voltage gain increases
  - b) input and output impedance increase
  - c) Bandwidth increases
  - d) input and output impedance decrease
- 7) Distortion with feedback is \_\_\_\_\_.
 

a) $D_f = \frac{D}{(1+KA_v)}$	b) $D_f = \frac{(1+KA_v)}{D}$
c) $D_f = D(1 + KA_v)$	d) $D_f = \frac{D}{(1+KA_{vf})}$

- 8) A three terminal monolithic IC regulator can be used as \_\_\_\_\_.
- An adjustable O/P voltage regulator alone
  - An adjustable O/P voltage regulator and current regulator
  - As a current regulator and a power switch
  - As a current regulator alone
- 9) Pre regulator in voltage regulator acts as \_\_\_\_\_.
- Reference voltage source
  - Constant current source
  - Pre amplifier
  - All above
- 10) The reference voltage & dropout voltage for fixed voltage regulator lm-337 respectively are \_\_\_\_\_.
- 1.2V, 9V
  - 1.25V, 3V
  - 1.2V, 57V
  - 2V, 32V
- 11) Schmitt trigger acts as a \_\_\_\_\_ multivibrator.
- Astable
  - Monostable
  - Bistable
  - None
- 12) It is required to stretch a 5μsec pulse to duration of 5msec. An appropriate circuit to be used for this is \_\_\_\_\_.
- Monostable multivibrator
  - Astable multivibrator
  - Schmitt trigger
  - Bistable multivibrator
- 13) For Wein bridge oscillator, R = 10 KΩ, find the range of capacitor required to generate variable frequency of 1 KHz to 10 KHz.
- 15.91nF - 1.591nF
  - 15.91μF - 1.591μF
  - 1.591μF - 15.91μF
  - none of these
- 14) The condition for sustained oscillation in Hartly oscillator is \_\_\_\_\_.
- $h_{fe} > \frac{L_1 - M}{L_2 - M}$
  - $h_{fe} \leq \frac{L_1 + M}{L_2 + M}$
  - $h_{fe} \geq \frac{L_1 + M}{L_2 + M}$
  - $h_{fe} \leq \frac{L_1 - M}{L_2 - M}$



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**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN – II**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**Section I**

**Q.2 Attempt any four of the following question.**

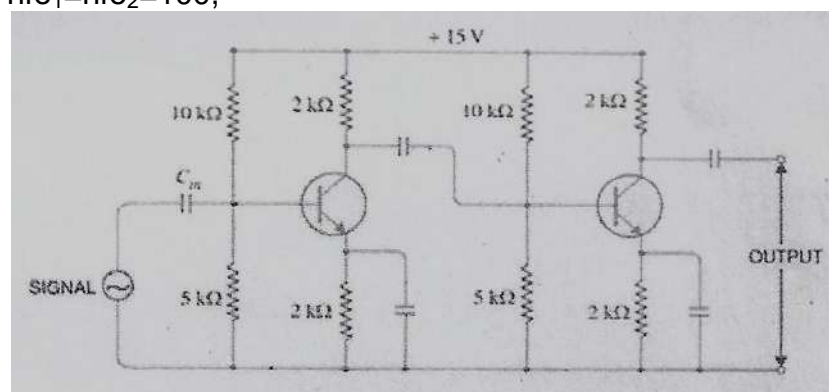
16

- Discuss the effect of Negative feedback on Voltage gain, Stability, Distortion and Bandwidth.
- Explain crossover distortion. Describe the method to minimize this distortion.
- An amplifier with negative feedback provides an output voltage of 6V with an input voltage of 0.25V. After removal of feedback it needs only 0.15V input to provide same output. Calculate
  - Voltage gain without feedback
  - Voltage gain with feedback
  - Feedback ratio
- What is necessity of cascading? Derive an expression for voltage gain of two stage R-C coupled amplifier.
- Compare the various method of coupling schemes on the basis of frequency & application.

**Q.3 Attempt any two of the following question.**

12

- Design a two stage voltage series feedback amplifier for overall gain with feedback 100 to meet the following specification  $R_L = 2k\Omega$ ,  $R_s = 600\Omega$ , output voltage = 8 V<sub>pp</sub> with supply voltage 12V, lower 3db frequency is 20Hz, use BC147B  $h_{fe}=280$ ,  $h_{ie} = 2.1 k\Omega$ .
- Explain working of Class B push pull amplifier. Derive an expression for its maximum efficiency and power dissipation. Sketch suitable waveforms.
- Figure shows two stages RC coupled amplifier. If input resistance of each stage is 1K $\Omega$ . Calculation individual voltage gain and overall voltage gain. Assume  $h_{fe1}=h_{fe2}=100$ ,



**Section II**

- Q.4 Attempt any four of the following question. 16**
- a) Derive an expression for frequency of oscillation & minimum gain for sustained oscillations in case of Wien bridge oscillator.
  - b) Design a circuit to turn ON LED for 15 seconds after applying trigger pulse, Initially the LED is in off condition.
  - c) Explain Thermal shutdown concept in IC- regulator.
  - d) Explain Working Principle of Crystal oscillator with its advantages & disadvantages.
  - e) Explain Divided by N network using IC-555.
- Q.5 Attempt any two of the following question. 12**
- a) Explain Free running oscillator with neat circuitry and Derive the expression for frequency.
  - b) Design adjustable voltage regulator for  $V_o = -5$  to  $-20V$  at  $I_o = -1A$  using LM-337 and Explain how 78XX can be used as an adjustable voltage regulator.
  - c) Design a transistorized series voltage regulator for  $20V$  at  $1.2A$ , At  $V_{in} = 30V$  (Assume necessary data).

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**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 70

- Instructions:** 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the option and rewrite the sentence. 14**

- 1) A three terminal monolithic IC regulator can be used as \_\_\_\_\_.  
 a) An adjustable O/P voltage regulator alone  
 b) An adjustable O/P voltage regulator and current regulator  
 c) As a current regulator and a power switch  
 d) As a current regulator alone
- 2) Pre regulator in voltage regulator acts as \_\_\_\_\_.  
 a) Reference voltage source      b) Constant current source  
 c) Pre amplifier                      d) All above
- 3) The reference voltage & dropout voltage for fixed voltage regulator lm-337 respectively are \_\_\_\_\_.  
 a) 1.2V, 9V                              b) 1.25V, 3V  
 c) 1.2V, 57V                             d) 2V, 32V
- 4) Schmitt trigger acts as a \_\_\_\_\_ multivibrator.  
 a) Astable                                b) Monostable  
 c) Bistable                                d) none
- 5) It is required to stretch a 5µsec pulse to duration of 5msec. An appropriate circuit to be used for this is \_\_\_\_\_.  
 a) Monostable multivibrator      b) Astable multivibrator  
 c) Schmitt trigger                      d) Bistable multivibrator
- 6) For Wein bridge oscillator, R = 10 KΩ, find the range of capacitor required to generate variable frequency of 1 KHz to 10 KHz.  
 a) 15.91nF - 1.591nF                b) 15.91µF - 1.591µF  
 c) 1.591µF - 15.91µF                d) none of these
- 7) The condition for sustained oscillation in Hartly oscillator is \_\_\_\_\_.  
 a)  $h_{fe} > \frac{L1-M}{L2-M}$                               b)  $h_{fe} \leq \frac{L1+M}{L2+M}$   
 c)  $h_{fe} \geq \frac{L1+M}{L2+M}$                               d)  $h_{fe} \leq \frac{L1-M}{L2-M}$
- 8) The upper 3dB frequency for N identical stages is given by \_\_\_\_\_.  
 a)  $f_{H(n)} = f_H \sqrt{2^{\frac{1}{n}} + 1}$                               b)  $f_{H(n)} = f_H \sqrt{2^{\frac{1}{n}} - 1}$   
 c)  $f_{H(n)} = f_H \sqrt{1 - 2^{\frac{1}{n}}}$                               d)  $f_{H(n)} = \frac{f_H}{\sqrt{2^{\frac{1}{n}+1}}}$



Seat  
No.

**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**Section I**

**Q.2 Attempt any four of the following question.**

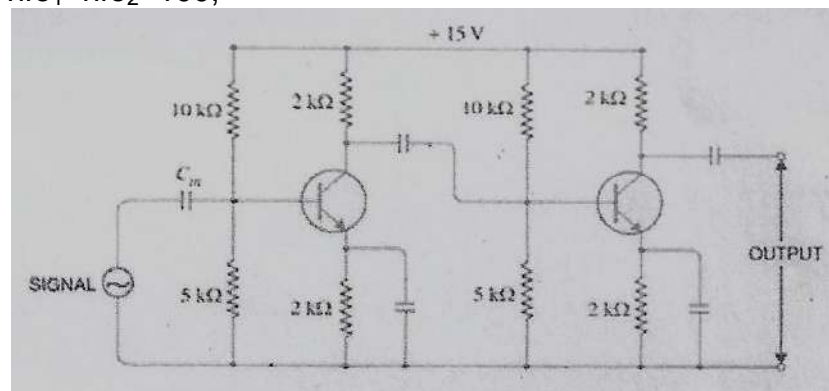
16

- Discuss the effect of Negative feedback on Voltage gain, Stability, Distortion and Bandwidth.
- Explain crossover distortion. Describe the method to minimize this distortion.
- An amplifier with negative feedback provides an output voltage of 6V with an input voltage of 0.25V. After removal of feedback it needs only 0.15V input to provide same output. Calculate
  - Voltage gain without feedback
  - Voltage gain with feedback
  - Feedback ratio
- What is necessity of cascading? Derive an expression for voltage gain of two stage R-C coupled amplifier.
- Compare the various method of coupling schemes on the basis of frequency & application.

**Q.3 Attempt any two of the following question.**

12

- Design a two stage voltage series feedback amplifier for overall gain with feedback 100 to meet the following specification  $R_L = 2k\Omega$ ,  $R_s = 600\Omega$ , output voltage = 8 V<sub>pp</sub> with supply voltage 12V, lower 3db frequency is 20Hz, use BC147B  $h_{fe}=280$ ,  $h_{ie} = 2.1 k\Omega$ .
- Explain working of Class B push pull amplifier. Derive an expression for its maximum efficiency and power dissipation. Sketch suitable waveforms.
- Figure shows two stages RC coupled amplifier. If input resistance of each stage is 1K $\Omega$ . Calculation individual voltage gain and overall voltage gain. Assume  $h_{fe1}=h_{fe2}=100$ ,



## Section II

- Q.4 Attempt any four of the following question. 16**
- a) Derive an expression for frequency of oscillation & minimum gain for sustained oscillations in case of Wien bridge oscillator.
  - b) Design a circuit to turn ON LED for 15 seconds after applying trigger pulse, Initially the LED is in off condition.
  - c) Explain Thermal shutdown concept in IC- regulator.
  - d) Explain Working Principle of Crystal oscillator with its advantages & disadvantages.
  - e) Explain Divided by N network using IC-555.
- Q.5 Attempt any two of the following question. 12**
- a) Explain Free running oscillator with neat circuitry and Derive the expression for frequency.
  - b) Design adjustable voltage regulator for  $V_o = -5$  to  $-20V$  at  $I_o = -1A$  using LM-337 and Explain how 78XX can be used as an adjustable voltage regulator.
  - c) Design a transistorized series voltage regulator for  $20V$  at  $1.2A$ , At  $V_{in} = 30V$  (Assume necessary data).

Seat  
No.

**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 70

- Instructions:** 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the option and rewrite the sentence. 14**

- 1) In CLASS A Power amplifier collector current in the output circuit flows for \_\_\_\_\_.
  - a)  $180^\circ$
  - b)  $360^\circ$
  - c) less than  $180^\circ$
  - d) greater than  $180^\circ$  & less than  $360^\circ$
- 2) If we employ voltage series feedback in amplifier then \_\_\_\_\_.
  - a) Voltage gain increases
  - b) input and output impedance increase
  - c) Bandwidth increases
  - d) input and output impedance decrease
- 3) Distortion with feedback is \_\_\_\_\_.
  - a)  $D_f = \frac{D}{(1+KA_v)}$
  - b)  $D_f = \frac{(1+KA_v)}{D}$
  - c)  $D_f = D(1 + KA_v)$
  - d)  $D_f = \frac{D}{(1+KA_{vf})}$
- 4) A three terminal monolithic IC regulator can be used as \_\_\_\_\_.
  - a) An adjustable O/P voltage regulator alone
  - b) An adjustable O/P voltage regulator and current regulator
  - c) As a current regulator and a power switch
  - d) As a current regulator alone
- 5) Pre regulator in voltage regulator acts as \_\_\_\_\_.
  - a) Reference voltage source
  - b) Constant current source
  - c) Pre amplifier
  - d) All above
- 6) The reference voltage & dropout voltage for fixed voltage regulator lm-337 respectively are \_\_\_\_\_.
  - a) 1.2V, 9V
  - b) 1.25V, 3V
  - c) 1.2V, 57V
  - d) 2V, 32V
- 7) Schmitt trigger acts as a \_\_\_\_\_ multivibrator.
  - a) Astable
  - b) Monostable
  - c) Bistable
  - d) none
- 8) It is required to stretch a 5µsec pulse to duration of 5msec. An appropriate circuit to be used for this is \_\_\_\_\_.
  - a) Monostable multivibrator
  - b) Astable multivibrator
  - c) Schmitt trigger
  - d) Bistable multivibrator

- 9) For Wein bridge oscillator,  $R = 10\text{ K}\Omega$ , find the range of capacitor required to generate variable frequency of 1 KHz to 10 KHz.
- a)  $15.91\text{ nF} - 1.591\text{ nF}$                       b)  $15.91\text{ }\mu\text{F} - 1.591\text{ }\mu\text{F}$   
 c)  $1.591\text{ }\mu\text{F} - 15.91\text{ }\mu\text{F}$                       d) none of these
- 10) The condition for sustained oscillation in Hartly oscillator is \_\_\_\_\_.
- a)  $h_{fe} > \frac{L1-M}{L2-M}$                                       b)  $h_{fe} \leq \frac{L1+M}{L2+M}$   
 c)  $h_{fe} \geq \frac{L1+M}{L2+M}$                                       d)  $h_{fe} \leq \frac{L1-M}{L2-M}$
- 11) The upper 3dB frequency for N identical stages is given by \_\_\_\_\_.
- a)  $f_{H(n)} = f_H \sqrt{2^{\frac{1}{n}} + 1}$                                       b)  $f_{H(n)} = f_H \sqrt{2^{\frac{1}{n}} - 1}$   
 c)  $f_{H(n)} = f_H \sqrt{1 - 2^{\frac{1}{n}}}$                                       d)  $f_{H(n)} = \frac{f_H}{\sqrt{2^{\frac{1}{n}+1}}}$
- 12) A multistage amplifier employs three stages each of which has voltage gain of 50, then overall gain of amplifier is \_\_\_\_\_.
- a) 101.93dB    b) 50.96dB  
 c) 509.6dB    d) 1010.96dB
- 13) CLASS AB operation is often used in large signal amplifier in order to \_\_\_\_.
- a) Get maximum efficiency  
 b) Remove even harmonics  
 c) Overcome cross over distortion  
 d) Reduce collector dissipation
- 14) The efficiency of CLASS C power amplifier is \_\_\_\_\_.
- a) 100%    b) 78.5 %  
 c) 50% to 78.5%                                      d) 78.5 %



Seat  
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**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**Section I**

**Q.2 Attempt any four of the following question.**

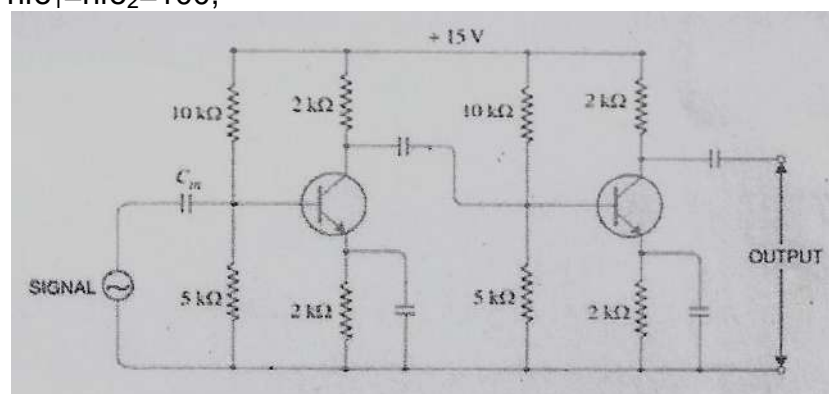
16

- Discuss the effect of Negative feedback on Voltage gain, Stability, Distortion and Bandwidth.
- Explain crossover distortion. Describe the method to minimize this distortion.
- An amplifier with negative feedback provides an output voltage of 6V with an input voltage of 0.25V. After removal of feedback it needs only 0.15V input to provide same output. Calculate
  - Voltage gain without feedback
  - Voltage gain with feedback
  - Feedback ratio
- What is necessity of cascading? Derive an expression for voltage gain of two stage R-C coupled amplifier.
- Compare the various method of coupling schemes on the basis of frequency & application.

**Q.3 Attempt any two of the following question.**

12

- Design a two stage voltage series feedback amplifier for overall gain with feedback 100 to meet the following specification  $R_L = 2k\Omega$ ,  $R_s = 600\Omega$ , output voltage = 8 V<sub>pp</sub> with supply voltage 12V, lower 3db frequency is 20Hz, use BC147B  $h_{fe}=280$ ,  $h_{ie} = 2.1 k\Omega$ .
- Explain working of Class B push pull amplifier. Derive an expression for its maximum efficiency and power dissipation. Sketch suitable waveforms.
- Figure shows two stages RC coupled amplifier. If input resistance of each stage is 1K $\Omega$ . Calculation individual voltage gain and overall voltage gain. Assume  $h_{fe1}=h_{fe2}=100$ ,



**Section II**

- Q.4 Attempt any four of the following question. 16**
- a) Derive an expression for frequency of oscillation & minimum gain for sustained oscillations in case of Wien bridge oscillator.
  - b) Design a circuit to turn ON LED for 15 seconds after applying trigger pulse, Initially the LED is in off condition.
  - c) Explain Thermal shutdown concept in IC- regulator.
  - d) Explain Working Principle of Crystal oscillator with its advantages & disadvantages.
  - e) Explain Divided by N network using IC-555.
- Q.5 Attempt any two of the following question. 12**
- a) Explain Free running oscillator with neat circuitry and Derive the expression for frequency.
  - b) Design adjustable voltage regulator for  $V_o = -5$  to  $-20V$  at  $I_o = -1A$  using LM-337 and Explain how 78XX can be used as an adjustable voltage regulator.
  - c) Design a transistorized series voltage regulator for  $20V$  at  $1.2A$ , At  $V_{in} = 30V$  (Assume necessary data).

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**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 70

- Instructions:** 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

**Q.1 Choose the correct alternative from the option and rewrite the sentence. 14**

- 1) The reference voltage & dropout voltage for fixed voltage regulator lm-337 respectively are \_\_\_\_\_.  
 a) 1.2V, 9V  
 b) 1.25V, 3V  
 c) 1.2V, 57V  
 d) 2V, 32V
- 2) Schmitt trigger acts as a \_\_\_\_\_ multivibrator.  
 a) Astable  
 b) Monostable  
 c) Bistable  
 d) none
- 3) It is required to stretch a 5µsec pulse to duration of 5msec. An appropriate circuit to be used for this is \_\_\_\_\_.  
 a) Monostable multivibrator  
 b) Astable multivibrator  
 c) Schmitt trigger  
 d) Bistable multivibrator
- 4) For Wein bridge oscillator, R = 10 KΩ, find the range of capacitor required to generate variable frequency of 1 KHz to 10 KHz.  
 a) 15.91nF - 1.591nF  
 b) 15.91µF - 1.591µF  
 c) 1.591µF - 15.91µF  
 d) none of these
- 5) The condition for sustained oscillation in Hartly oscillator is \_\_\_\_\_.  
 a)  $h_{fe} > \frac{L_1 - M}{L_2 - M}$   
 b)  $h_{fe} \leq \frac{L_1 + M}{L_2 + M}$   
 c)  $h_{fe} \geq \frac{L_1 + M}{L_2 + M}$   
 d)  $h_{fe} \leq \frac{L_1 - M}{L_2 - M}$
- 6) The upper 3dB frequency for N identical stages is given by \_\_\_\_\_.  
 a)  $f_{H(n)} = f_H \sqrt{2^{\frac{1}{n}} + 1}$   
 b)  $f_{H(n)} = f_H \sqrt{2^{\frac{1}{n}} - 1}$   
 c)  $f_{H(n)} = f_H \sqrt{1 - 2^{\frac{1}{n}}}$   
 d)  $f_{H(n)} = \frac{f_H}{\sqrt{2^{\frac{1}{n} + 1}}}$
- 7) A multistage amplifier employs three stages each of which has voltage gain of 50, then overall gain of amplifier is \_\_\_\_\_.  
 a) 101.93dB  
 b) 50.96dB  
 c) 509.6dB  
 d) 1010.96dB

- 8) CLASS AB operation is often used in large signal amplifier in order to \_\_\_\_.
- Get maximum efficiency
  - Remove even harmonics
  - Overcome cross over distortion
  - Reduce collector dissipation
- 9) The efficiency of CLASS C power amplifier is \_\_\_\_.
- 100%
  - 78.5 %
  - 50% to 78.5%
  - 78.5 %
- 10) In CLASS A Power amplifier collector current in the output circuit flows for \_\_\_\_.
- $180^\circ$
  - $360^\circ$
  - less than  $180^\circ$
  - greater than  $180^\circ$  & less than  $360^\circ$
- 11) If we employ voltage series feedback in amplifier then \_\_\_\_.
- Voltage gain increases
  - input and output impedance increase
  - Bandwidth increases
  - input and output impedance decrease
- 12) Distortion with feedback is \_\_\_\_.
- $D_f = \frac{D}{(1+KA_v)}$
  - $D_f = \frac{(1+KA_v)}{D}$
  - $D_f = D(1 + KA_v)$
  - $D_f = \frac{D}{(1+KA_{vf})}$
- 13) A three terminal monolithic IC regulator can be used as \_\_\_\_.
- An adjustable O/P voltage regulator alone
  - An adjustable O/P voltage regulator and current regulator
  - As a current regulator and a power switch
  - As a current regulator alone
- 14) Pre regulator in voltage regulator acts as \_\_\_\_.
- Reference voltage source
  - Constant current source
  - Pre amplifier
  - All above

Seat  
No.

**S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRONICS CIRCUIT ANALYSIS AND DESIGN - II**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if required.  
 3) Figures to right indicate maximum marks.  
 4) Use of data sheet is allowed.

**Section I**

**Q.2 Attempt any four of the following question.**

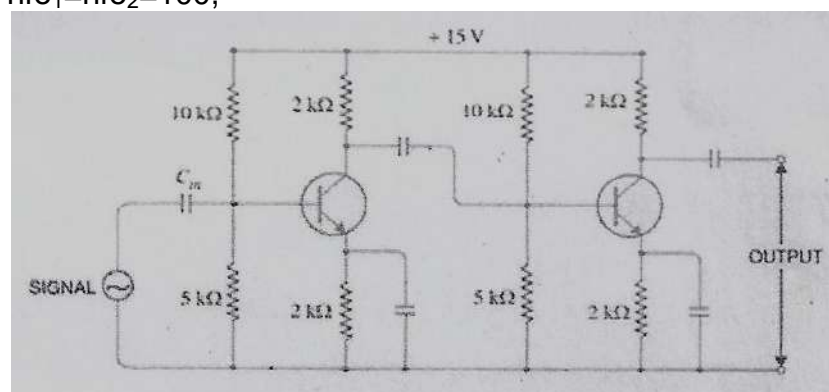
16

- Discuss the effect of Negative feedback on Voltage gain, Stability, Distortion and Bandwidth.
- Explain crossover distortion. Describe the method to minimize this distortion.
- An amplifier with negative feedback provides an output voltage of 6V with an input voltage of 0.25V. After removal of feedback it needs only 0.15V input to provide same output. Calculate
  - Voltage gain without feedback
  - Voltage gain with feedback
  - Feedback ratio
- What is necessity of cascading? Derive an expression for voltage gain of two stage R-C coupled amplifier.
- Compare the various method of coupling schemes on the basis of frequency & application.

**Q.3 Attempt any two of the following question.**

12

- Design a two stage voltage series feedback amplifier for overall gain with feedback 100 to meet the following specification  $R_L = 2k\Omega$ ,  $R_s = 600\Omega$ , output voltage = 8 V<sub>pp</sub> with supply voltage 12V, lower 3db frequency is 20Hz, use BC147B  $h_{fe}=280$ ,  $h_{ie} = 2.1 k\Omega$ .
- Explain working of Class B push pull amplifier. Derive an expression for its maximum efficiency and power dissipation. Sketch suitable waveforms.
- Figure shows two stages RC coupled amplifier. If input resistance of each stage is 1K $\Omega$ . Calculation individual voltage gain and overall voltage gain. Assume  $h_{fe1}=h_{fe2}=100$ ,



**Section II**

- Q.4 Attempt any four of the following question. 16**
- a) Derive an expression for frequency of oscillation & minimum gain for sustained oscillations in case of Wien bridge oscillator.
  - b) Design a circuit to turn ON LED for 15 seconds after applying trigger pulse, Initially the LED is in off condition.
  - c) Explain Thermal shutdown concept in IC- regulator.
  - d) Explain Working Principle of Crystal oscillator with its advantages & disadvantages.
  - e) Explain Divided by N network using IC-555.
- Q.5 Attempt any two of the following question. 12**
- a) Explain Free running oscillator with neat circuitry and Derive the expression for frequency.
  - b) Design adjustable voltage regulator for  $V_o = -5$  to  $-20V$  at  $I_o = -1A$  using LM-337 and Explain how 78XX can be used as an adjustable voltage regulator.
  - c) Design a transistorized series voltage regulator for  $20V$  at  $1.2A$ , At  $V_{in} = 30V$  (Assume necessary data).

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Set **P**

**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 wavelength  $\lambda$  frequency  $f$  and the velocity of the light are related to each other by the relation, \_\_\_\_\_.
  - a)  $\lambda = f/c$
  - b)  $\lambda fc = 1$
  - c)  $\lambda f = c$
  - d)  $\lambda c = f$
- 2) Most of the power in an AM signal is in the \_\_\_\_\_.
  - a) Carrier
  - b) Upper sideband
  - c) Lower sideband
  - d) Modulating signal
- 3) Ceramic filters upper limit frequency is, \_\_\_\_\_.
  - a) 20hz
  - b) 20Khz
  - c) 200khz
  - d) 20Mhz
- 4) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is \_\_\_\_\_.
  - a) Unchanged
  - b) Half
  - c) Double
  - d) Increase by 50 percent
- 5) In low level AM systems amplifiers following the modulated stages must be, \_\_\_\_\_.
  - a) Linear Devices
  - b) Harmonic devices
  - c) Class C amplifiers
  - d) Nonlinear devices
- 6) The Modulation Index is given by, \_\_\_\_\_.
  - a)  $M = E_m/E_c$
  - b)  $M = E_c/E_m$
  - c)  $M = 2E_c/E_m$
  - d)  $M = E_m/2$
- 7) A 400W carrier is modulated with a modulation Index of 75%. Calculate the DSBSC power, \_\_\_\_\_.
  - a) 113.6W
  - b) 112.5W
  - c) 121.5W
  - d) 122.5W
- 8) Thermal noise voltage in a resistor R is given by \_\_\_\_\_.
  - a)  $\sqrt{4RkTB}$
  - b)  $kTB$
  - c)  $TBk^2$
  - d) None
- 9) Which of the following method is employed in telephony, \_\_\_\_\_.
  - a) TDM
  - b) FDM
  - c) Both a & b
  - d) None of above

- 10) In FM for a given frequency deviation the modulation index varies, \_\_\_\_\_.
- a) inversely as the modulating frequency
  - b) directly as the modulating frequency
  - c) independent of the changes in modulating signal
  - d) None of above
- 11) Diffraction of electromagnetic waves is caused by \_\_\_\_\_.
- a) the edges of shape obstacles
  - b) the reflection from the ground
  - c) the spherical wave fronts
  - d) The wave passing through a slot
- 12) An interfering signal with a frequency equal to the received signal plus twice the if is called, \_\_\_\_\_.
- a) Image frequency
  - b) Center frequency
  - c) Rest frequency
  - d) Interference frequency
- 13) Which of the following is considered as an indirect method of generating FM?
- a) Reactance modulator
  - b) Balanced modulator
  - c) Varactor diode modulator
  - d) Armstrong system
- 14) Which of the following analog modulation scheme requires the minimum transmitted power and minimum channel bandwidth?
- a) VSB
  - b) SSB
  - c) DSB-SC
  - d) AM



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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four:** **16**
- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal?
  - b) Explain the problems occurring in the TRF receivers?
  - c) With suitable diagram and waveforms explain a diode demodulator?
  - d) A carrier of 1000 kHz is Simultaneously modulated by signals of 2KHz 6KHz & 2KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power.
  - e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?
- Q.3 Attempt any two:** **12**
- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's?
  - b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier?
  - c) With suitable block diagram explain superhetrodyne communication receiver?

**Section – II**

- Q.4 Attempt any four:** **16**
- a) Discuss the terms frequency deviation, modulation index, percentage modulation in FM?
  - b) Illustrate with a diagram the Telephone Transmitter set, Receiver set?
  - c) Discuss the different types of noises in detail?
  - d) Discuss the concept of LOS & radiation with respect to wave propagation?
  - e) Define antenna gain and explain polarization of an antenna?
- Q.5 Attempt any two:** **12**
- a) Discuss the different characteristics of an antenna?
  - b) Illustrate the block diagram of Armstrong method of FM generation. Also draw the phasor diagram?
  - c) Discuss the different methods of Noise calculation?



- 9) Most of the power in an AM signal is in the \_\_\_\_\_.  
 a) Carrier  
 b) Upper sideband  
 c) Lower sideband  
 d) Modulating signal
- 10) Ceramic filters upper limit frequency is, \_\_\_\_\_.  
 a) 20hz  
 b) 20Khz  
 c) 200khz  
 d) 20Mhz
- 11) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is \_\_\_\_\_.  
 a) Unchanged  
 b) Half  
 c) Double  
 d) Increase by 50 percent
- 12) In low level AM systems amplifiers following the modulated stages must be, \_\_\_\_\_.  
 a) Linear Devices  
 b) Harmonic devices  
 c) Class C amplifiers  
 d) Nonlinear devices
- 13) The Modulation Index is given by, \_\_\_\_\_.  
 a)  $M = E_m/E_c$   
 b)  $M = E_c/E_m$   
 c)  $M = 2E_c/E_m$   
 d)  $M = E_m/2$
- 14) A 400W carrier is modulated with a modulation Index of 75%. Calculate the DSBSC power, \_\_\_\_\_.  
 a) 113.6W  
 b) 112.5W  
 c) 121.5W  
 d) 122.5W

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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

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

- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal?
- b) Explain the problems occurring in the TRF receivers?
- c) With suitable diagram and waveforms explain a diode demodulator?
- d) A carrier of 1000 kHz is Simultaneously modulated by signals of 2KHz 6KHz & 2KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power.
- e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?

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

- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's?
- b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier?
- c) With suitable block diagram explain superhetrodyne communication receiver?

**Section – II**

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

- a) Discuss the terms frequency deviation, modulation index, percentage modulation in FM?
- b) Illustrate with a diagram the Telephone Transmitter set, Receiver set?
- c) Discuss the different types of noises in detail?
- d) Discuss the concept of LOS & radiation with respect to wave propagation?
- e) Define antenna gain and explain polarization of an antenna?

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

- a) Discuss the different characteristics of an antenna?
- b) Illustrate the block diagram of Armstrong method of FM generation. Also draw the phasor diagram?
- c) Discuss the different methods of Noise calculation?

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Set R

**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019  
Electronics Engineering  
ANALOG COMMUNICATION**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
2) 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 low level AM systems amplifiers following the modulated stages must be, \_\_\_\_\_.
 

a) Linear Devices	b) Harmonic devices
c) Class C amplifiers	d) Nonlinear devices
  
- 2) The Modulation Index is given by, \_\_\_\_\_.
 

a) $M = E_m/E_c$	b) $M = E_c/E_m$
c) $M = 2E_c/E_m$	d) $M = E_m/2$
  
- 3) A 400W carrier is modulated with a modulation Index of 75%. Calculate the DSBSC power, \_\_\_\_\_.
 

a) 113.6W	b) 112.5W
c) 121.5W	d) 122.5W
  
- 4) Thermal noise voltage in a resistor R is given by \_\_\_\_\_.
 

a) $\sqrt{4RkTB}$	b) KTB
c) $TBk^2$	d) None
  
- 5) Which of the following method is employed in telephony, \_\_\_\_\_.
 

a) TDM	b) FDM
c) Both a & b	d) None of above
  
- 6) In FM for a given frequency deviation the modulation index varies, \_\_\_\_\_.
 

a) inversely as the modulating frequency
b) directly as the modulating frequency
c) independent of the changes in modulating signal
d) None of above
  
- 7) Diffraction of electromagnetic waves is caused by \_\_\_\_\_.
 

a) the edges of shape obstacles
b) the reflection from the ground
c) the spherical wave fronts
d) The wave passing through a slot
  
- 8) An interfering signal with a frequency equal to the received signal plus twice the if is called, \_\_\_\_\_.
 

a) Image frequency	b) Center frequency
c) Rest frequency	d) Interference frequency

- 9) Which of the following is considered as an indirect method of generating FM?
- a) Reactance modulator                      b) Balanced modulator  
c) Varactor diode modulator                d) Armstrong system
- 10) Which of the following analog modulation scheme requires the minimum transmitted power and minimum channel bandwidth?
- a) VSB    b) SSB  
c) DSB-SC                                        d) AM
- 11) The wavelength  $\lambda$  frequency  $f$  and the velocity of the light are related to each other by the relation, \_\_\_\_\_.
- a)  $\lambda = f/c$                                         b)  $\lambda fc = 1$   
c)  $\lambda f = c$                                         d)  $\lambda c = f$
- 12) Most of the power in an AM signal is in the \_\_\_\_\_.
- a) Carrier                                         b) Upper sideband  
c) Lower sideband                                d) Modulating signal
- 13) Ceramic filters upper limit frequency is, \_\_\_\_\_.
- a) 20hz    b) 20Khz  
c) 200khz                                         d) 20Mhz
- 14) The modulation index of an AM WAVE is changed from 0 to 1. The transmitted power is \_\_\_\_\_.
- a) Unchanged                                     b) Half  
c) Double                                         d) Increase by 50 percent

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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.  
3) Assume suitable data if necessary.

**Section – I**

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

- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal?
- b) Explain the problems occurring in the TRF receivers?
- c) With suitable diagram and waveforms explain a diode demodulator?
- d) A carrier of 1000 kHz is Simultaneously modulated by signals of 2KHz 6KHz & 2KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power.
- e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?

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

- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's?
- b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier?
- c) With suitable block diagram explain superhetrodyne communication receiver?

**Section – II**

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

- a) Discuss the terms frequency deviation, modulation index, percentage modulation in FM?
- b) Illustrate with a diagram the Telephone Transmitter set, Receiver set?
- c) Discuss the different types of noises in detail?
- d) Discuss the concept of LOS & radiation with respect to wave propagation?
- e) Define antenna gain and explain polarization of an antenna?

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

- a) Discuss the different characteristics of an antenna?
- b) Illustrate the block diagram of Armstrong method of FM generation. Also draw the phasor diagram?
- c) Discuss the different methods of Noise calculation?

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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) 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 FM for a given frequency deviation the modulation index varies, \_\_\_\_\_.  
 a) inversely as the modulating frequency  
 b) directly as the modulating frequency  
 c) independent of the changes in modulating signal  
 d) None of above
- 2) Diffraction of electromagnetic waves is caused by \_\_\_\_\_.  
 a) the edges of shape obstacles  
 b) the reflection from the ground  
 c) the spherical wave fronts  
 d) The wave passing through a slot
- 3) An interfering signal with a frequency equal to the received signal plus twice the if is called, \_\_\_\_\_.  
 a) Image frequency  
 b) Center frequency  
 c) Rest frequency  
 d) Interference frequency
- 4) Which of the following is considered as an indirect method of generating FM?  
 a) Reactance modulator  
 b) Balanced modulator  
 c) Varactor diode modulator  
 d) Armstrong system
- 5) Which of the following analog modulation scheme requires the minimum transmitted power and minimum channel bandwidth?  
 a) VSB  
 b) SSB  
 c) DSB-SC  
 d) AM
- 6) The wavelength  $\lambda$  frequency  $f$  and the velocity of the light are related to each other by the relation, \_\_\_\_\_.  
 a)  $\lambda = f/c$   
 b)  $\lambda fc = 1$   
 c)  $\lambda f = c$   
 d)  $\lambda c = f$
- 7) Most of the power in an AM signal is in the \_\_\_\_\_.  
 a) Carrier  
 b) Upper sideband  
 c) Lower sideband  
 d) Modulating signal





Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019**  
**Electronics Engineering**  
**ANALOG COMMUNICATION**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Attempt any four:** **16**
- a) Derive the expression for equation of AM wave and its instantaneous value of AM signal?
  - b) Explain the problems occurring in the TRF receivers?
  - c) With suitable diagram and waveforms explain a diode demodulator?
  - d) A carrier of 1000 kHz is Simultaneously modulated by signals of 2KHz 6KHz & 2KHz with modulation indices of 35%, 55% and 75% respectively. What are the frequencies present in modulated wave and what is radiated power.
  - e) Discuss the advantages of SSB over DSB and AM and also disadvantages of SSB?
- Q.3 Attempt any two:** **12**
- a) Discuss principle of Balance Modulator and with suitable diagram give the working of Balanced modulator using FET's?
  - b) With suitable circuit diagram, waveforms, advantages & disadvantages give the working of Grid Modulated Class C Amplifier?
  - c) With suitable block diagram explain superhetrodyne communication receiver?

**Section – II**

- Q.4 Attempt any four:** **16**
- a) Discuss the terms frequency deviation, modulation index, percentage modulation in FM?
  - b) Illustrate with a diagram the Telephone Transmitter set, Receiver set?
  - c) Discuss the different types of noises in detail?
  - d) Discuss the concept of LOS & radiation with respect to wave propagation?
  - e) Define antenna gain and explain polarization of an antenna?
- Q.5 Attempt any two:** **12**
- a) Discuss the different characteristics of an antenna?
  - b) Illustrate the block diagram of Armstrong method of FM generation. Also draw the phasor diagram?
  - c) Discuss the different methods of Noise calculation?

Seat No.	
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Set	P
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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.  
2) Draw neat sketches wherever 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**

- The rotor slots in three phase squirrel cage I.M. are kept \_\_\_\_\_.  
a) Skewed  
b) Parallel  
c) Twisted  
d) None of the above
- The back emf of a 250 V dc motor with armature resistance 1 ohm and  $I_a=50$  A is \_\_\_\_\_.  
a) 200 V  
b) 230 V  
c) 260 V  
d) 180 V
- For application traction following motor is suitable \_\_\_\_\_.  
a) dc series motor  
b) dc shunt motor  
c) both a and b  
d) none
- The dc \_\_\_\_\_ motor never be switched ON no load.  
a) Shunt  
b) Series  
c) Compound  
d) None
- Following is not three phase transformer connection.  
a) V – V  
b) T – T  
c) Y – Y  
d) I – I
- In case of \_\_\_\_\_ three phase transformer Line voltages of both sides are in phase with each other.  
a) Star-star  
b) V-V  
c) Delta-Delta  
d) T-T
- Stepper motor is basically \_\_\_\_\_.  
a) D.C. motor  
b) Synchronous motor  
c) Slip ring 3 phase induction motor  
d) None of the above
- In case of Scott connection for both primary and secondary winding of main transformer consists of \_\_\_\_\_ % tapping.  
a) 83  
b) 66.66  
c) 50  
d) 58



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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
 2) Draw neat sketches wherever necessary.  
 3) Figures to the right indicate full marks.

**Section – I**

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

- a) Write short note on swinburns test on DC motor.
- b) Draw and explain characteristics of D.C. motor.
- c) The armature of a 4 pole dc generator is required to generate an emf of 520 V on open circuit when revolving at a speed of 660 rpm. Calculate the magnetic flux per pole required if the armature has 144 slots with 2 coil sides per slot, each coil consisting of three turns. The armature is wave wound.
- d) Draw neat diagram of 3 point starter and explain its working.
- e) Drive the EMF equation for generator.
- f) Write short note on electric drive.

**Q.3 Attempt following:** **12**

- a) Write short note on
  - 1) capacitor start capacitor run single phase induction motor
  - 2) Servo motor

**OR**

- a) A shunt motor runs at a 500 rpm on 200V. Its armature resistance is 0.5 ohm and the current taken is 30A in addition to field current. What resistance must be placed in series in order that the speed may be reduced to 300 rpm. The current in armature remaining the same.
- b) What are the advantages of electrical braking? Elaborate plugging and rheostatic braking used for dc shunt motor.

**Section – II**

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

- a) Drive the torque equation of three phase induction motor and write conditions for maximum torque under various conditions.
- b) A three phase induction motor having star connected rotor has an induced emf of 80 volts between slip rings at standstill on open circuit. The rotor has a resistance and reactance per phase of 1 ohm and 4 ohm respectively. Calculate current/phase and power factor when
  - 1) Slip rings are short circuited
  - 2) Slip rings are connected to a star connected rheostat of 3 ohm per phase
- c) Draw neat diagram of star delta starter and explain its operation.
- d) Write needs and methods of power factor improvement.
- e) Write note on power factor and causes of low power factor.

- f) Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of the circuit
- 1) When both readings are positive?
  - 2) When latter reading is obtained after reversing the connection to the current coil of one instrument?

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

- a) Drive the expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phasor diagram.
- b) Describe the construction of three phase transformer and write working principle of its.
- c) Two wattmeters connected on 3 line, 3 phase ac line to measure ac power and read 6717 watts and 2558 watts. Find the power drawn by the balanced load and its power factor.

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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.  
 2) Draw neat sketches wherever 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) In case of Scott connection for both primary and secondary winding of main transformer consists of \_\_\_\_\_ % tapping.
  - a) 83
  - b) 66.66
  - c) 50
  - d) 58
- 2) Main cause of poor lagging power factor is due to use of \_\_\_\_\_.
  - a) Filament lamp
  - b) Resistive load
  - c) Induction motor
  - d) Water heater
- 3) A permanent split phase capacitor motor does not have \_\_\_\_\_.
  - a) Centrifugal switch
  - b) Starting winding
  - c) Squirrel case rotor
  - d) High power factor
- 4) The rotational speed of given stepper motor is determined by solely by \_\_\_\_\_.
  - a) Shaft load
  - b) Step pulse frequency
  - c) Polarity of stator current
  - d) Magnitude of stator current
- 5) One of the basic requirement of servo motor is that it must produce high torque at all \_\_\_\_\_.
  - a) Loads
  - b) Frequencies
  - c) Speed
  - d) Voltages
- 6) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.
  - a) Current in the conductor
  - b) Flux
  - c) Resultant force on conductor
  - d) None of the above
- 7) Armature current in D.C. generators is given to the external circuit through \_\_\_\_\_.
  - a) Strips
  - b) Commutator
  - c) Solid connection
  - d) Slip rings
- 8) The rotor slots in three phase squirrel cage I.M. are kept \_\_\_\_\_.
  - a) Skewed
  - b) Parallel
  - c) Twisted
  - d) None of the above





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Set Q
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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
2) Draw neat sketches wherever necessary.  
3) Figures to the right indicate full marks.

**Section – I**

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

- a) Write short note on swinburns test on DC motor.
- b) Draw and explain characteristics of D.C. motor.
- c) The armature of a 4 pole dc generator is required to generate an emf of 520 V on open circuit when revolving at a speed of 660 rpm. Calculate the magnetic flux per pole required if the armature has 144 slots with 2 coil sides per slot, each coil consisting of three turns. The armature is wave wound.
- d) Draw neat diagram of 3 point starter and explain its working.
- e) Derive the EMF equation for generator.
- f) Write short note on electric drive.

**Q.3 Attempt following:** **12**

- a) Write short note on
  - 1) capacitor start capacitor run single phase induction motor
  - 2) Servo motor

**OR**

- a) A shunt motor runs at a 500 rpm on 200V. Its armature resistance is 0.5 ohm and the current taken is 30A in addition to field current. What resistance must be placed in series in order that the speed may be reduced to 300 rpm. The current in armature remaining the same.
- b) What are the advantages of electrical braking? Elaborate plugging and rheostatic braking used for dc shunt motor.

**Section – II**

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

- a) Derive the torque equation of three phase induction motor and write conditions for maximum torque under various conditions.
- b) A three phase induction motor having star connected rotor has an induced emf of 80 volts between slip rings at standstill on open circuit. The rotor has a resistance and reactance per phase of 1 ohm and 4 ohm respectively. Calculate current/phase and power factor when
  - 1) Slip rings are short circuited
  - 2) Slip rings are connected to a star connected rheostat of 3 ohm per phase
- c) Draw neat diagram of star delta starter and explain its operation.
- d) Write needs and methods of power factor improvement.
- e) Write note on power factor and causes of low power factor.

**SLR-FM-667**

- f) Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of the circuit
- 1) When both readings are positive?
  - 2) When latter reading is obtained after reversing the connection to the current coil of one instrument?

**Q.5 Attempt any two.**

**12**

- a) Drive the expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phasor diagram.
- b) Describe the construction of three phase transformer and write working principle of its.
- c) Two wattmeters connected on 3 line, 3 phase ac line to measure ac power and read 6717 watts and 2558 watts. Find the power drawn by the balanced load and its power factor.

Seat No.	
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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.  
 2) Draw neat sketches wherever 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) Following is not three phase transformer connection.
 

a) V – V	b) T – T
c) Y – Y	d) I – I
- 2) In case of \_\_\_\_\_ three phase transformer Line voltages of both sides are in phase with each other.
 

a) Star-star	b) V-V
c) Delta-Delta	d) T-T
- 3) Stepper motor is basically \_\_\_\_\_.
  - a) D.C. motor
  - b) Synchronous motor
  - c) Slip ring 3 phase induction motor
  - d) None of the above
- 4) In case of Scott connection for both primary and secondary winding of main transformer consists of \_\_\_\_\_ % tapping.
 

a) 83	b) 66.66
c) 50	d) 58
- 5) Main cause of poor lagging power factor is due to use of \_\_\_\_\_.
 

a) Filament lamp	b) Resistive load
c) Induction motor	d) Water heater
- 6) A permanent split phase capacitor motor does not have \_\_\_\_\_.
 

a) Centrifugal switch	b) Starting winding
c) Squirrel case rotor	d) High power factor
- 7) The rotational speed of given stepper motor is determined by solely by \_\_\_\_\_.
 

a) Shaft load	b) Step pulse frequency
c) Polarity of stator current	d) Magnitude of stator current
- 8) One of the basic requirement of servo motor is that it must produce high torque at all \_\_\_\_\_.
 

a) Loads	b) Frequencies
c) Speed	d) Voltages

- 9) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.  
a) Current in the conductor      b) Flux  
c) Resultant force on conductor      d) None of the above
- 10) Armature current in D.C. generators is given to the external circuit through \_\_\_\_\_.  
a) Strips      b) Commutator  
c) Solid connection      d) Slip rings
- 11) The rotor slots in three phase squirrel cage I.M. are kept \_\_\_\_\_.  
a) Skewed      b) Parallel  
c) Twisted      d) None of the above
- 12) The back emf of a 250 V dc motor with armature resistance 1 ohm and  $I_a=50$  A is \_\_\_\_\_.  
a) 200 V      b) 230 V  
c) 260 V      d) 180 V
- 13) For application traction following motor is suitable \_\_\_\_\_.  
a) dc series motor      b) dc shunt motor  
c) both a and b      d) none
- 14) The dc \_\_\_\_\_ motor never be switched ON no load.  
a) Shunt      b) Series  
c) Compound      d) None

Seat No.	
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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

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

**Section – I**

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

- a) Write short note on swinburns test on DC motor.
- b) Draw and explain characteristics of D.C. motor.
- c) The armature of a 4 pole dc generator is required to generate an emf of 520 V on open circuit when revolving at a speed of 660 rpm. Calculate the magnetic flux per pole required if the armature has 144 slots with 2 coil sides per slot, each coil consisting of three turns. The armature is wave wound.
- d) Draw neat diagram of 3 point starter and explain its working.
- e) Drive the EMF equation for generator.
- f) Write short note on electric drive.

**Q.3 Attempt following:** **12**

- a) Write short note on
  - 1) capacitor start capacitor run single phase induction motor
  - 2) Servo motor

**OR**

- a) A shunt motor runs at a 500 rpm on 200V. Its armature resistance is 0.5 ohm and the current taken is 30A in addition to field current. What resistance must be placed in series in order that the speed may be reduced to 300 rpm. The current in armature remaining the same.
- b) What are the advantages of electrical braking? Elaborate plugging and rheostatic braking used for dc shunt motor.

**Section – II**

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

- a) Drive the torque equation of three phase induction motor and write conditions for maximum torque under various conditions.
- b) A three phase induction motor having star connected rotor has an induced emf of 80 volts between slip rings at standstill on open circuit. The rotor has a resistance and reactance per phase of 1 ohm and 4 ohm respectively. Calculate current/phase and power factor when
  - 1) Slip rings are short circuited
  - 2) Slip rings are connected to a star connected rheostat of 3 ohm per phase
- c) Draw neat diagram of star delta starter and explain its operation.
- d) Write needs and methods of power factor improvement.
- e) Write note on power factor and causes of low power factor.

- f) Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of the circuit
- 1) When both readings are positive?
  - 2) When latter reading is obtained after reversing the connection to the current coil of one instrument?

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

- a) Drive the expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phasor diagram.
- b) Describe the construction of three phase transformer and write working principle of its.
- c) Two wattmeters connected on 3 line, 3 phase ac line to measure ac power and read 6717 watts and 2558 watts. Find the power drawn by the balanced load and its power factor.

Seat No.	
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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- 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) A permanent split phase capacitor motor does not have \_\_\_\_\_.  
 a) Centrifugal switch                      b) Starting winding  
 c) Squirrel case rotor                      d) High power factor
- 2) The rotational speed of given stepper motor is determined by solely by \_\_\_\_\_.  
 a) Shaft load                                  b) Step pulse frequency  
 c) Polarity of stator current              d) Magnitude of stator current
- 3) One of the basic requirement of servo motor is that it must produce high torque at all \_\_\_\_\_.  
 a) Loads    b) Frequencies  
 c) Speed    d) Voltages
- 4) According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point the direction of \_\_\_\_\_.  
 a) Current in the conductor              b) Flux  
 c) Resultant force on conductor        d) None of the above
- 5) Armature current in D.C. generators is given to the external circuit through \_\_\_\_\_.  
 a) Strips    b) Commutator  
 c) Solid connection                          d) Slip rings
- 6) The rotor slots in three phase squirrel cage I.M. are kept \_\_\_\_\_.  
 a) Skewed                                        b) Parallel  
 c) Twisted                                        d) None of the above
- 7) The back emf of a 250 V dc motor with armature resistance 1 ohm and  $I_a=50$  A is \_\_\_\_\_.  
 a) 200 V    b) 230 V  
 c) 260 V    d) 180 V
- 8) For application traction following motor is suitable \_\_\_\_\_.  
 a) dc series motor                            b) dc shunt motor  
 c) both a and b                                d) none

- 9) The dc \_\_\_\_\_ motor never be switched ON no load.
- a) Shunt
  - b) Series
  - c) Compound
  - d) None
- 10) Following is not three phase transformer connection.
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  - b) T-T
  - c) Y-Y
  - d) I-I
- 11) In case of \_\_\_\_\_ three phase transformer Line voltages of both sides are in phase with each other.
- a) Star-star
  - b) V-V
  - c) Delta-Delta
  - d) T-T
- 12) Stepper motor is basically \_\_\_\_\_.
- a) D.C. motor
  - b) Synchronous motor
  - c) Slip ring 3 phase induction motor
  - d) None of the above
- 13) In case of Scott connection for both primary and secondary winding of main transformer consists of \_\_\_\_\_ % tapping.
- a) 83
  - b) 66.66
  - c) 50
  - d) 58
- 14) Main cause of poor lagging power factor is due to use of \_\_\_\_\_.
- a) Filament lamp
  - b) Resistive load
  - c) Induction motor
  - d) Water heater



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**S.E. (Part -II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTRICAL MACHINES**

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

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.  
2) Draw neat sketches wherever necessary.  
3) Figures to the right indicate full marks.

**Section – I**

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

- a) Write short note on swinburns test on DC motor.
- b) Draw and explain characteristics of D.C. motor.
- c) The armature of a 4 pole dc generator is required to generate an emf of 520 V on open circuit when revolving at a speed of 660 rpm. Calculate the magnetic flux per pole required if the armature has 144 slots with 2 coil sides per slot, each coil consisting of three turns. The armature is wave wound.
- d) Draw neat diagram of 3 point starter and explain its working.
- e) Derive the EMF equation for generator.
- f) Write short note on electric drive.

**Q.3 Attempt following:** **12**

- a) Write short note on
  - 1) capacitor start capacitor run single phase induction motor
  - 2) Servo motor

**OR**

- a) A shunt motor runs at a 500 rpm on 200V. Its armature resistance is 0.5 ohm and the current taken is 30A in addition to field current. What resistance must be placed in series in order that the speed may be reduced to 300 rpm. The current in armature remaining the same.
- b) What are the advantages of electrical braking? Elaborate plugging and rheostatic braking used for dc shunt motor.

**Section – II**

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

- a) Derive the torque equation of three phase induction motor and write conditions for maximum torque under various conditions.
- b) A three phase induction motor having star connected rotor has an induced emf of 80 volts between slip rings at standstill on open circuit. The rotor has a resistance and reactance per phase of 1 ohm and 4 ohm respectively. Calculate current/phase and power factor when
  - 1) Slip rings are short circuited
  - 2) Slip rings are connected to a star connected rheostat of 3 ohm per phase
- c) Draw neat diagram of star delta starter and explain its operation.
- d) Write needs and methods of power factor improvement.
- e) Write note on power factor and causes of low power factor.

**SLR-FM-667**

- f) Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of the circuit
- 1) When both readings are positive?
  - 2) When latter reading is obtained after reversing the connection to the current coil of one instrument?

**Q.5 Attempt any two.**

**12**

- a) Drive the expression for power factor of three phase inductive load in terms of wattmeters reading. Draw phasor diagram.
- b) Describe the construction of three phase transformer and write working principle of its.
- c) Two wattmeters connected on 3 line, 3 phase ac line to measure ac power and read 6717 watts and 2558 watts. Find the power drawn by the balanced load and its power factor.

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
 2) 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) Schmitt trigger output is \_\_\_\_\_ for sine wave input.
  - a) triangular wave
  - b) Square wave
  - c) saw tooth wave
  - d) None of these
- 2) In a sample and hold circuit, op amp is used as
  - a) sample circuit
  - b) voltage follower
  - c) Hold circuit
  - d) Peak detector
- 3) Pin number 3 of a 741 is
  - a) Inverting input
  - b) Non inverting input
  - c)  $+V_{CC}$
  - d)  $-V_{EE}$
- 4) Output resistance of a 741C is in
  - a)  $M \Omega$
  - b)  $\mu\Omega$
  - c)  $\Omega$
  - d) None of these
- 5) Output offset voltage changes with
  - a) Time
  - b) Temperature
  - c) Supply voltage
  - d) All of these
- 6) Find out the resolution of 8 bit DAC/ADC?
  - a) 562
  - b) 625
  - c) 256
  - d) 265
- 7) In VLSI IC, the no. of components integrated on the same chip
  - a)  $<10$
  - b)  $<100$
  - c)  $>100$
  - d)  $>1000$
- 8) A notch filter is a \_\_\_\_\_ filter.
  - a) wide band stop
  - b) wide band pass
  - c) narrow band stop
  - d) narrow band pass
- 9) A triangular wave form generator has a comparator and
  - a) Differentiator
  - b) Subtractor
  - c) Adder
  - d) Integrator



Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Draw & explain any four circuits mentioned below: 16**
- Op amp as integrator
  - Summing and scaling amplifier
  - V to I converter with grounded load
  - High frequency op amp equivalent
  - Voltage transfer curve with a comment on significance of its slope.
- Q.3 Attempt any two. 12**
- The 741 C op amp having below parameters is connected as a non inverting amplifier with  $R_1=1K\Omega$  and  $R_F=10K\Omega$ . Compute  $A_F, R_{iF}, R_{oF}, f_F$  and  $V_{OOT}$ .  
 Given:  $A=200,000$ ,  $R_i=2M\Omega$ ,  $R_o=75\Omega$ ,  $f_o=5KHz$ , Supply voltage= $\pm 15V$   
 output voltage swing= $\pm 13 V$
  - What is slew rate? How it is specified? What is significance? Show with an example how it limits close loop applications of op amp.
  - What is input bias current? How to compensate for it? Derive equation for it.

**Section – II**

- Q.4 Attempt any four 16**
- Draw and explain precision full wave rectifier.
  - Explain antilog amplifier using op amp.
  - Describe Schmitt trigger with UTP and LTP.
  - Draw and explain square wave generator.
  - Explain positive and negative clamper circuits.
- Q.5 Attempt any two. 12**
- Design and explain a phase shift oscillator to generate a sinusoidal signal of 200 Hz.
  - Draw & explain band pass filter.
  - Explain first order LPF. Design LPF at a cutoff frequency of 1KHz with a passband gain of 2.

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
 2) 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 notch filter is a \_\_\_\_\_ filter.
  - a) wide band stop
  - b) wide band pass
  - c) narrow band stop
  - d) narrow band pass
- 2) A triangular wave form generator has a comparator and
  - a) Differentiator
  - b) Subtractor
  - c) Adder
  - d) Integrator
- 3) Average of the two input currents of op amp is called as
  - a) offset current
  - b) input differential current
  - c) input bias current
  - d) none of these
- 4) The pins of 741 op amp used for voltage offset null are
  - a) 1,4,5
  - b) 1,6
  - c) 1,5
  - d) 2,4,5
- 5) For a Schmitt trigger ,  $V_{ut}-V_{lt}$  is called as
  - a) differential voltage
  - b) loop gain
  - c) Hysteresis
  - d) Trigger
- 6) For a phase shift oscillator, gain must be \_\_\_\_\_
  - a) 3
  - b) 29
  - c) Less than 1
  - d) None of these
- 7) The gain bandwidth product of 741 is
  - a) 4 MHz
  - b) 5 MHz
  - c) 1 MHz
  - d) 10 MHz
- 8) Schmitt trigger output is \_\_\_\_\_ for sine wave input.
  - a) triangular wave
  - b) Square wave
  - c) saw tooth wave
  - d) None of these
- 9) In a sample and hold circuit, op amp is used as
  - a) sample circuit
  - b) voltage follower
  - c) Hold circuit
  - d) Peak detector

- 10) Pin number 3 of a 741 is  
a) Inverting input  
b) Non inverting input  
c)  $+V_{CC}$   
d)  $-V_{EE}$
- 11) Output resistance of a 741C is in  
a)  $M \Omega$   
b)  $\mu\Omega$   
c)  $\Omega$   
d) None of these
- 12) Output offset voltage changes with  
a) Time  
b) Temperature  
c) Supply voltage  
d) All of these
- 13) Find out the resolution of 8 bit DAC/ADC?  
a) 562  
b) 625  
c) 256  
d) 265
- 14) In VLSI IC, the no. of components integrated on the same chip  
a)  $<10$   
b)  $<100$   
c)  $>100$   
d)  $>1000$

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Draw & explain any four circuits mentioned below: 16**
- a) Op amp as integrator
  - b) Summing and scaling amplifier
  - c) V to I converter with grounded load
  - d) High frequency op amp equivalent
  - e) Voltage transfer curve with a comment on significance of its slope.

- Q.3 Attempt any two. 12**
- a) The 741 C op amp having below parameters is connected as a non inverting amplifier with  $R_1=1K\Omega$  and  $R_F=10K\Omega$ . Compute  $A_F, R_{iF}, R_{oF}, f_F$  and  $V_{OOT}$ .  
 Given:  $A=200,000$ ,  $R_i=2M\Omega$ ,  $R_o=75\Omega$ ,  $f_o=5KHz$ , Supply voltage= $\pm 15V$   
 output voltage swing= $\pm 13V$
  - b) What is slew rate? How it is specified? What is significance? Show with an example how it limits close loop applications of op amp.
  - c) What is input bias current? How to compensate for it? Derive equation for it.

**Section – II**

- Q.4 Attempt any four 16**
- a) Draw and explain precision full wave rectifier.
  - b) Explain antilog amplifier using op amp.
  - c) Describe Schmitt trigger with UTP and LTP.
  - d) Draw and explain square wave generator.
  - e) Explain positive and negative clamper circuits.

- Q.5 Attempt any two. 12**
- a) Design and explain a phase shift oscillator to generate a sinusoidal signal of 200 Hz.
  - b) Draw & explain band pass filter.
  - c) Explain first order LPF. Design LPF at a cutoff frequency of 1KHz with a passband gain of 2.



Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
 2) 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) Output offset voltage changes with
 

a) Time	b) Temperature
c) Supply voltage	d) All of these
- 2) Find out the resolution of 8 bit DAC/ADC?
 

a) 562	b) 625
c) 256	d) 265
- 3) In VLSI IC, the no. of components integrated on the same chip
 

a) <10	b) <100
c) >100	d) >1000
- 4) A notch filter is a \_\_\_\_\_ filter.
 

a) wide band stop	b) wide band pass
c) narrow band stop	d) narrow band pass
- 5) A triangular wave form generator has a comparator and
 

a) Differentiator	b) Subtractor
c) Adder	d) Integrator
- 6) Average of the two input currents of op amp is called as
 

a) offset current	b) input differential current
c) input bias current	d) none of these
- 7) The pins of 741 op amp used for voltage offset null are
 

a) 1,4,5	b) 1,6
c) 1,5	d) 2,4,5
- 8) For a Schmitt trigger,  $V_{ut}-V_{lt}$  is called as
 

a) differential voltage	b) loop gain
c) Hysteresis	d) Trigger
- 9) For a phase shift oscillator, gain must be \_\_\_\_\_
 

a) 3	b) 29
c) Less than 1	d) None of these

- 10) The gain bandwidth product of 741 is  
a) 4 MHz  
b) 5 MHz  
c) 1 MHz  
d) 10 MHz
- 11) Schmitt trigger output is \_\_\_\_\_ for sine wave input.  
a) triangular wave  
b) Square wave  
c) saw tooth wave  
d) None of these
- 12) In a sample and hold circuit, op amp is used as  
a) sample circuit  
b) voltage follower  
c) Hold circuit  
d) Peak detector
- 13) Pin number 3 of a 741 is  
a) Inverting input  
b) Non inverting input  
c)  $+V_{CC}$   
d)  $-V_{EE}$
- 14) Output resistance of a 741C is in  
a)  $M \Omega$   
b)  $\mu\Omega$   
c)  $\Omega$   
d) None of these

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Draw & explain any four circuits mentioned below: 16**
- a) Op amp as integrator
  - b) Summing and scaling amplifier
  - c) V to I converter with grounded load
  - d) High frequency op amp equivalent
  - e) Voltage transfer curve with a comment on significance of its slope.

- Q.3 Attempt any two. 12**
- a) The 741 C op amp having below parameters is connected as a non inverting amplifier with  $R_1=1K\Omega$  and  $R_F=10K\Omega$ . Compute  $A_F, R_{iF}, R_{oF}, f_F$  and  $V_{OOT}$ .  
 Given:  $A=200,000$ ,  $R_i=2M\Omega$ ,  $R_o=75\Omega$ ,  $f_o=5KHz$ , Supply voltage= $\pm 15V$   
 output voltage swing= $\pm 13V$
  - b) What is slew rate? How it is specified? What is significance? Show with an example how it limits close loop applications of op amp.
  - c) What is input bias current? How to compensate for it? Derive equation for it.

**Section – II**

- Q.4 Attempt any four 16**
- a) Draw and explain precision full wave rectifier.
  - b) Explain antilog amplifier using op amp.
  - c) Describe Schmitt trigger with UTP and LTP.
  - d) Draw and explain square wave generator.
  - e) Explain positive and negative clamper circuits.

- Q.5 Attempt any two. 12**
- a) Design and explain a phase shift oscillator to generate a sinusoidal signal of 200 Hz.
  - b) Draw & explain band pass filter.
  - c) Explain first order LPF. Design LPF at a cutoff frequency of 1KHz with a passband gain of 2.

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book  
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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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  - b) input differential current
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  - d) none of these
- 2) The pins of 741 op amp used for voltage offset null are
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  - b) 1,6
  - c) 1,5
  - d) 2,4,5
- 3) For a Schmitt trigger,  $V_{ut}-V_{lt}$  is called as
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  - b) loop gain
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- 4) For a phase shift oscillator, gain must be \_\_\_\_\_
  - a) 3
  - b) 29
  - c) Less than 1
  - d) None of these
- 5) The gain bandwidth product of 741 is
  - a) 4 MHz
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  - c) 1 MHz
  - d) 10 MHz
- 6) Schmitt trigger output is \_\_\_\_\_ for sine wave input.
  - a) triangular wave
  - b) Square wave
  - c) saw tooth wave
  - d) None of these
- 7) In a sample and hold circuit, op amp is used as
  - a) sample circuit
  - b) voltage follower
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- 8) Pin number 3 of a 741 is
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- 9) Output resistance of a 741C is in
  - a)  $M \Omega$
  - b)  $\mu\Omega$
  - c)  $\Omega$
  - d) None of these

- 10) Output offset voltage changes with
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|-------------------|-----------------|
| a) Time           | b) Temperature  |
| c) Supply voltage | d) All of these |
- 11) Find out the resolution of 8 bit DAC/ADC?
- |        |        |
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- 12) In VLSI IC, the no. of components integrated on the same chip
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- |                     |                     |
|---------------------|---------------------|
| a) wide band stop   | b) wide band pass   |
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- 14) A triangular wave form generator has a comparator and
- |                   |               |
|-------------------|---------------|
| a) Differentiator | b) Subtractor |
| c) Adder          | d) Integrator |

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**LINEAR INTEGRATED CIRCUITS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
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**Section – I**

- Q.2 Draw & explain any four circuits mentioned below: 16**
- Op amp as integrator
  - Summing and scaling amplifier
  - V to I converter with grounded load
  - High frequency op amp equivalent
  - Voltage transfer curve with a comment on significance of its slope.

- Q.3 Attempt any two. 12**

- The 741 C op amp having below parameters is connected as a non inverting amplifier with  $R_1=1K\Omega$  and  $R_F=10K\Omega$ . Compute  $A_F, R_{iF}, R_{oF}, f_F$  and  $V_{OOT}$ .  
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- What is slew rate? How it is specified? What is significance? Show with an example how it limits close loop applications of op amp.
- What is input bias current? How to compensate for it? Derive equation for it.

**Section – II**

- Q.4 Attempt any four 16**

- Draw and explain precision full wave rectifier.
- Explain antilog amplifier using op amp.
- Describe Schmitt trigger with UTP and LTP.
- Draw and explain square wave generator.
- Explain positive and negative clamper circuits.

- Q.5 Attempt any two. 12**

- Design and explain a phase shift oscillator to generate a sinusoidal signal of 200 Hz.
- Draw & explain band pass filter.
- Explain first order LPF. Design LPF at a cutoff frequency of 1KHz with a passband gain of 2.

Seat No.	
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Set **P**

**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Assume Suitable data if required & state the assumptions.  
 3) Figure 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) Given a unit step function  $u(t)$ , its time derivative is \_\_\_\_\_.
  - a) A unit impulse
  - b) Another step function
  - c) A unit ramp function
  - d) A sine function
- 2) If the signal  $x(t) = (1/2)^n u(n-2)$ , then signal  $x(n+3)$  is guaranteed to be zero for values of  $n$  \_\_\_\_\_.
  - a)  $-\infty \leq n \leq -1$
  - b)  $-\infty \leq n \leq -2$
  - c)  $-\infty \leq n \leq 2$
  - d)  $2 \leq n \leq \infty$
- 3) The impulse response of discrete time is  $h[n] = (1/3)^n u[n - 3]$ , the system is \_\_\_\_\_.
  - a) Casual
  - b) Stable and non causal
  - c) unstable and casual
  - d) Stable and casual
- 4)  $u(n+1) - u(n) =$  \_\_\_\_\_.
  - a)  $u(n + 1)$
  - b)  $u(2n - 1)$
  - c)  $u(n^2 - 1)$
  - d)  $\delta(n + 1)$
- 5) If  $h_1(t)$  is the impulse response of invertible system and  $h_2(t)$  is the impulse response of its inverse system then their convolution  $h_1(t)*h_2(t)$  will be \_\_\_\_\_.
  - a)  $u(t)$
  - b)  $\delta(t)$
  - c)  $\delta(-t)$
  - d) None of these
- 6) The Fourier transform of impulse response of differentiator is \_\_\_\_\_.
  - a)  $J\omega$
  - b)  $2\pi\delta(\omega)$
  - c)  $\omega$
  - d) None of these
- 7) If  $X(\omega)$  is the Fourier transform of the signal  $x(n)$ , then what is the Fourier transform of the signal  $x(n-k)$ ?
  - a)  $e^{j\omega k} \cdot X(-\omega)$
  - b)  $e^{j\omega k} \cdot X(\omega)$
  - c)  $e^{-j\omega k} \cdot X(-\omega)$
  - d)  $e^{-j\omega k} \cdot X(\omega)$
- 8) What would be the probability of an event 'G' if  $G_1$  denotes its complement, according to the axioms of probability?
  - a)  $P(G) = 1 / P(G_1)$
  - b)  $P(G) = 1 - P(G_1)$
  - c)  $P(G) = 1 + P(G_1)$
  - d)  $P(G) = 1 * P(G_1)$

- 9) Which function has a provision of determining the similarity between the signal and its delayed version?
- a) Auto-correlation Function      b) Cross-correlation Function  
c) Both a & b      d) None of the above
- 10)  $X(n) = \{1, 2, 3, 4, 5, 6\}$  has ROC
- ↑
- a) Entire z plane Expect  $z = 0$  and  $z = \infty$   
b) Entire z plane Expect  $z = 0$   
c) Entire z plane Expect  $z = \infty$   
d)  $z = 0$  only
- 11) When is the system said to be causal as well as stable in accordance to pole/zero of ROC specified by system transfer function?
- a) Only if all the poles of system transfer function lie in left-half of S-plane  
b) Only if all the poles of system transfer function lie in right-half of S-plane  
c) Only if all the poles of system transfer function lie at the centre of S-plane  
d) None of the above
- 12) If  $x(t)$  signal is multiplied with train of impulses, the process is \_\_\_\_\_.
- a) Convolution      b) Z transform  
c) Sampling      d) Laplace transform
- 13) The analog signal  $m(t) = 4 \cos 50 \pi t + 3 \sin 300 \pi t - \cos 150 \pi t$ . Then the value of nyquist are  $F_s$  is \_\_\_\_\_.
- a) 300 Hz      b) 150 Hz  
c) 200 Hz      d) 100 Hz
- 14) Which among the below mentioned standard PDFs is/are applicable to discrete random variables?
- a) Gaussian distribution      b) Rayleigh distribution  
c) Poisson distribution      d) All of the above



Seat  
No.

**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume Suitable data if required & state the assumptions.  
 3) Figure to the right indicates full marks.

**Section – I****Q.2 Solve any FOUR of the Following.****16**

- a) A discrete time signal  $x[n]$  is given below. Sketch and label each of the following signals.

$$x[n] = \{2, 3, 1, 4, 2\}$$

↑

- 1)  $x[n - 1]$
  - 2)  $x[n/2]$
  - 3)  $x[n + 1]\delta[n - 1]$
  - 4)  $\{x[n] + x[-n]\}u[n]$
- b) Explain how to represent periodic signal using Fourier transform.
- c) Consider the LTI systems with following impulse responses.
- 1)  $h[n] = (1/3)^n u[n]$
  - 2)  $h(t) = e^{-3t} u(t - 3)$
- Determine whether each of the above system is causal and or stable. Justify your answer.
- d) Determine and sketch the even and odd parts of a signal  
 $x(t) = u(t+1) - u(t-3)$
- e) What is an invertible system? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.

$$y(t) = 2x(t - 3/2)$$

- f) Determine and sketch the inverse Fourier transform of following.

$$x(j\omega) = \begin{cases} 1 & |\omega| < P \\ 0 & |\omega| > P \end{cases}$$

**Q.3 Solve any TWO of the Following.****12**

- a) Compute convolution integral of  $x(t) = u(t+1) - u(t-1)$  and  $h(t) = u(t-1)$ .
- b) For the continuous time periodic signal.

$$x(t) = 2 + \cos\left(\frac{4\pi}{3}t\right) + 4 \sin\left(\frac{9\pi}{3}t\right)$$

Determine the fundamental frequency  $\Omega_0$  and the Fourier series coefficient of Exponential Fourier series  $a_k$ . Sketch the magnitude

- c) Obtain the Fourier transform of following signals

- 1)  $x(t) = e^{-3|t|}$
- 2)  $x(t) = \delta(t + 2)$

Sketch the magnitude.

## Section – II

**Q.4 Solve any FOUR of the Following.**

16

- a) Explain impulse train sampling with neat diagram.  
 b) Consider an LTI system with the system function.

$$H(s) = \frac{s - 1}{(s + 1)(s - 2)}$$

Obtain the impulse response  $h(t)$  of the system and state the region of convergence of the system if the system is.

- 1) Causal  
 2) anti causal & stable  
 c) What is cross correlation? State its properties.  
 d) Define probability density function & state its properties.  
 e) Find the Nyquist rate for the signal.

$$x(t) = \frac{1}{2\pi} \cos(4000\pi t) \cos(100\pi t)$$

**Q.5 Solve any TWO of the Following.**

12

- a) Define & sketch following distribution function.  
 1) Uniform distribution  
 2) Gaussian distribution  
 Obtain the expression for mean of Uniform distribution  
 b) Consider the Parallel connection of two LTI systems whose system transfer functions are as given below.

1)  $H_1(z) = \frac{z}{z - 1/3}$  ROC:  $|z| > 1/3$

2)  $H_2(z) = \frac{z}{z - 2}$  ROC:  $|z| < 2$

Obtain the overall transfer function. Also determine whether the overall system is stable and or causal. Justify your answer.

- c) A continuous time random variable has probability density function (PDF) expressed as

$$f_x(x) = 2e^{-2x} \text{ for } x \geq 0$$

- 1) Determine the probability that it will take a value between 1 & 3.  
 2) Also determine cumulative distribution function for the random variable.

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

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**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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- 1) What would be the probability of an event 'G' if G1 denotes its complement, according to the axioms of probability?
  - a)  $P(G) = 1 / P(G1)$
  - b)  $P(G) = 1 - P(G1)$
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- 8) Given a unit step function  $u(t)$ , its time derivative is \_\_\_\_\_.  
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a)  $-\infty \leq n \leq -1$   
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Seat  
No.

**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I****Q.2 Solve any FOUR of the Following.****16**

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  - 4)  $\{x[n] + x[-n]\}u[n]$
- b) Explain how to represent periodic signal using Fourier transform.
- c) Consider the LTI systems with following impulse responses.
- 1)  $h[n] = (1/3)^n u[n]$
  - 2)  $h(t) = e^{-3t} u(t - 3)$
- Determine whether each of the above system is causal and or stable. Justify your answer.
- d) Determine and sketch the even and odd parts of a signal  
 $x(t) = u(t+1) - u(t-3)$
- e) What is an invertible system? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.

$$y(t) = 2x(t - 3/2)$$

- f) Determine and sketch the inverse Fourier transform of following.

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Sketch the magnitude.

## Section – II

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1)  $H_1(z) = \frac{z}{z - 1/3}$  ROC:  $|z| > 1/3$

2)  $H_2(z) = \frac{z}{z - 2}$  ROC:  $|z| < 2$

Obtain the overall transfer function. Also determine whether the overall system is stable and or causal. Justify your answer.

- c) A continuous time random variable has probability density function (PDF) expressed as

$$f_x(x) = 2e^{-2x} \text{ for } x \geq 0$$

- 1) Determine the probability that it will take a value between 1 & 3.  
 2) Also determine cumulative distribution function for the random variable.

Seat No.	
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**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
 2) Assume Suitable data if required & state the assumptions.  
 3) Figure 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) If  $h_1(t)$  is the impulse response of invertible system and  $h_2(t)$  is the impulse response of its inverse system then their convolution  $h_1(t)*h_2(t)$  will be \_\_\_\_\_.
  - a)  $u(t)$
  - b)  $\delta(t)$
  - c)  $\delta(-t)$
  - d) None of these
- 2) The Fourier transform of impulse response of differentiator is \_\_\_\_\_.
  - a)  $J\omega$
  - b)  $2\pi\delta(\omega)$
  - c)  $\omega$
  - d) None of these
- 3) If  $X(\omega)$  is the Fourier transform of the signal  $x(n)$ , then what is the Fourier transform of the signal  $x(n-k)$ ?
  - a)  $e^{j\omega k}.X(-\omega)$
  - b)  $e^{j\omega k}.X(\omega)$
  - c)  $e^{-j\omega k}.X(-\omega)$
  - d)  $e^{-j\omega k}.X(\omega)$
- 4) What would be the probability of an event 'G' if  $G_1$  denotes its complement, according to the axioms of probability?
  - a)  $P(G) = 1 / P(G_1)$
  - b)  $P(G) = 1 - P(G_1)$
  - c)  $P(G) = 1 + P(G_1)$
  - d)  $P(G) = 1 * P(G_1)$
- 5) Which function has a provision of determining the similarity between the signal and its delayed version?
  - a) Auto-correlation Function
  - b) Cross-correlation Function
  - c) Both a & b
  - d) None of the above
- 6)  $X(n)=\{1, 2, 3, 4, 5, 6\}$  has ROC
 

↑

  - a) Entire z plane Expect  $z = 0$  and  $z = \infty$
  - b) Entire z plane Expect  $z = 0$
  - c) Entire z plane Expect  $z = \infty$
  - d)  $z = 0$  only
- 7) When is the system said to be causal as well as stable in accordance to pole/zero of ROC specified by system transfer function?
  - a) Only if all the poles of system transfer function lie in left-half of S-plane
  - b) Only if all the poles of system transfer function lie in right-half of S-plane
  - c) Only if all the poles of system transfer function lie at the centre of S-plane
  - d) None of the above





Seat  
No.

**S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**SIGNALS AND SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
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**Section – I****Q.2 Solve any FOUR of the Following.****16**

- a) A discrete time signal  $x[n]$  is given below. Sketch and label each of the following signals.

$$x[n] = \{2, 3, 1, 4, 2\}$$

↑

- 1)  $x[n - 1]$
  - 2)  $x[n/2]$
  - 3)  $x[n + 1]\delta[n - 1]$
  - 4)  $\{x[n] + x[-n]\}u[n]$
- b) Explain how to represent periodic signal using Fourier transform.
- c) Consider the LTI systems with following impulse responses.
- 1)  $h[n] = (1/3)^n u[n]$
  - 2)  $h(t) = e^{-3t} u(t - 3)$
- Determine whether each of the above system is causal and or stable. Justify your answer.
- d) Determine and sketch the even and odd parts of a signal  
 $x(t) = u(t+1) - u(t-3)$
- e) What is an invertible system? Determine whether the following system is invertible. If it is, construct the inverse system. If it is not find the two input signals to the system that have the same output.

$$y(t) = 2x(t - 3/2)$$

- f) Determine and sketch the inverse Fourier transform of following.

$$x(j\omega) = \begin{cases} 1 & |\omega| < P \\ 0 & |\omega| > P \end{cases}$$

**Q.3 Solve any TWO of the Following.****12**

- a) Compute convolution integral of  $x(t) = u(t+1) - u(t-1)$  and  $h(t) = u(t-1)$ .
- b) For the continuous time periodic signal.

$$x(t) = 2 + \cos\left(\frac{4\pi}{3}t\right) + 4 \sin\left(\frac{9\pi}{3}t\right)$$

Determine the fundamental frequency  $\Omega_0$  and the Fourier series coefficient of Exponential Fourier series  $a_k$ . Sketch the magnitude

- c) Obtain the Fourier transform of following signals

- 1)  $x(t) = e^{-3|t|}$
- 2)  $x(t) = \delta(t + 2)$

Sketch the magnitude.

## Section – II

**Q.4 Solve any FOUR of the Following.**

16

- a) Explain impulse train sampling with neat diagram.  
 b) Consider an LTI system with the system function.

$$H(s) = \frac{s - 1}{(s + 1)(s - 2)}$$

Obtain the impulse response  $h(t)$  of the system and state the region of convergence of the system if the system is.

- 1) causal
  - 2) anti causal & stable
- c) What is cross correlation? State its properties.  
 d) Define probability density function & state its properties.  
 e) Find the Nyquist rate for the signal.

$$x(t) = \frac{1}{2\pi} \cos(4000\pi t) \cos(100\pi t)$$

**Q.5 Solve any TWO of the Following.**

12

- a) Define & sketch following distribution function.  
 1) Uniform distribution  
 2) Gaussian distribution  
 Obtain the expression for mean of Uniform distribution
- b) Consider the Parallel connection of two LTI systems whose system transfer functions are as given below.

1)  $H_1(z) = \frac{z}{z - 1/3}$  ROC:  $|z| > 1/3$

2)  $H_2(z) = \frac{z}{z - 2}$  ROC:  $|z| < 2$

Obtain the overall transfer function. Also determine whether the overall system is stable and or causal. Justify your answer.

- c) A continuous time random variable has probability density function (PDF) expressed as

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- 1) Determine the probability that it will take a value between 1 & 3.
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**SIGNALS AND SYSTEMS**

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- 2) Also determine cumulative distribution function for the random variable.

Seat  
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**CONTROL SYSTEMS**

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

Max. Marks: 70

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

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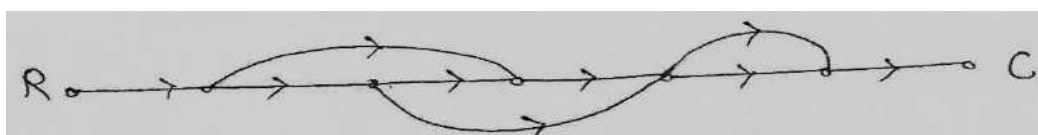
**MCQ/Objective Type Questions**

Duration: 30 Minutes

Marks: 14

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

- 1) The transient response of feedback system with damping factor zero \_\_\_\_\_.
- a) Rises slowly                                      b) Rises quickly  
 c) Decays quickly                                  d) None of these
- 2) A node having only incoming branches is called as \_\_\_\_\_.
- a) Source node                                      b) Sink node  
 c) Output node                                      d) Both b and c
- 3) The steady state error due to ramp input for a type zero system is equal to \_\_\_\_\_.
- a) Zero    b) Infinite  
 c) Non zero number                              d) Constant
- 4) The steady state analysis of system depends on \_\_\_\_\_.
- a) Order of system                                  b) Type of system  
 c) Both a & b                                      d) None of these
- 5) One of the basic requirements of a servomotor is that it must produce high torque at all \_\_\_\_\_.
- a) Loads    b) Frequencies  
 c) Speeds    d) Voltages
- 6) The order of the system will be obtained from \_\_\_\_\_.
- a) Closed loop transfer function of system  
 b) Characteristic equation of system  
 c) Open loop transfer function of system  
 d) a & b
- 7) The \_\_\_\_\_ number of forward paths are present in given SFG.



- a) 5    b) 6  
 c) 3    d) 4

- 8) Routh Hurwitz criterion gives \_\_\_\_\_.
- a) Number of roots in the right half of the s-plane
  - b) Value of the roots
  - c) Number of roots in the left half of the s-plane
  - d) Number of roots in the top half of the s-plane
- 9) The polar plot of a transfer function passes through the critical point (-1,0). Gain margin is.
- a) Zero
  - b) -1dB
  - c) 1dB
  - d) Infinity
- 10) The compensator required to improve the steady- state response of a system is.
- a) lag
  - b) lead
  - c) lag-lead
  - d) none of these
- 11) Consider the loop transfer function  $K(s+6)/(s+3)(s+5)$  In the root locus diagram the centroid will be located at.
- a) -4
  - b) -1
  - c) -2
  - d) -3
- 12) The frequency at which the phase of the system acquires \_\_\_\_\_ is known as 'Phase crossover frequency'.
- a)  $90^\circ$
  - b)  $-90^\circ$
  - c)  $180^\circ$
  - d)  $-180^\circ$
- 13) Which condition is used to verify the existence of a particular point on the root locus?
- a) Amplitude
  - b) Frequency
  - c) Magnitude
  - d) Angle
- 14) Due to an addition of pole at origin, the polar plot gets shifted by \_\_\_\_\_ at  $\omega = 0$ ?
- a)  $-45^\circ$
  - b)  $-60^\circ$
  - c)  $-90^\circ$
  - d)  $-180^\circ$



Seat  
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**CONTROL SYSTEMS**

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

Max. Marks: 56

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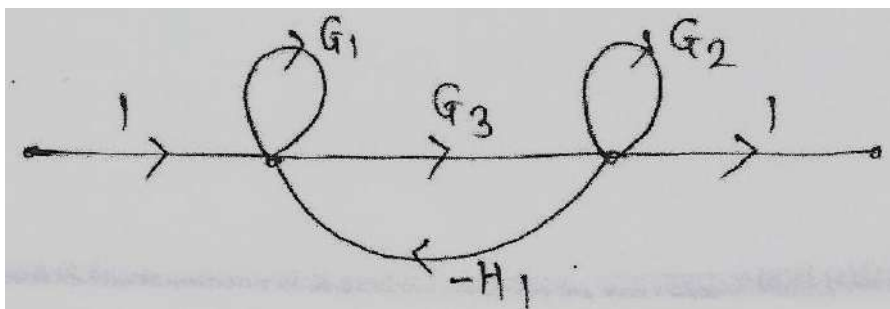
**Section – I**

**Q.2 Solve any four.** **16**

- a) Derive transfer function of armature controlled DC servomotor.
- b) Differentiate between open loop & closed loop control systems.
- c) Define following terms with reference to SFG
  - 1) Source node
  - 2) Forward path
  - 3) Self loop
  - 4) Non-touching loops
- d) Determine the acceleration and velocity constant for the system having.
 
$$G(S) = \frac{1}{s(s+4)} \quad H(S) = \frac{s}{(\delta+s)}$$
- e) Explain DC servo motor with neat diagram.

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

- a) Write any six block diagram reduction rules to obtain overall transfer function of system.
- b) Determine the overall transfer function for the following system shown with the help of SFG using Mason's Gain formula.



- c) Determine the following transient parameters for the Second order system having characteristic equation  $S^2 + 6S + 25 = 0$ 
  - 1) Maximum peak overshoot
  - 2) damped frequency
  - 3) Settling time at 5% tolerance band
  - 4) damping factor

## Section – II

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

- a) Sketch the polar plot for the following system.

$$G(s)H(s) = \frac{(s + 10)}{(s + 1)}$$

- b) Determine the stability of the system for following characteristic equation by Hurwitz method.

$$F(s) = s^3 + s^2 + s + 4 = 0$$

- c) What is necessity of compensator? Explain lead compensator.  
 d) Define absolute stability and conditionally stability of the system.  
 e) Find the forced sinusoidal response for following system  $G(s) = \frac{(s+1)}{(s+2)}$  for the input signal  $r(t) = 10 \cos(2t + 45^\circ)$

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

- a) Sketch the root locus for the system.

$$G(s) = \frac{K(s + 1)}{s(s + 2)}$$

- b) Explain the nature of Bode plots for.

- 1) System gain 'K'
- 2) Poles at origin
- 3) Zeros at origin

- c) A system has  $G(s)H(s) = \frac{K}{s(s+2)(s+4)(s+8)}$ , where K is positive. Determine the range of K for stability using Routh's criterion.

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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
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**CONTROL SYSTEMS**

Day & Date: Friday, 06-12-2019  
 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) Routh Hurwitz criterion gives \_\_\_\_\_.
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  - c) Number of roots in the left half of the s-plane
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- 2) The polar plot of a transfer function passes through the critical point (-1,0). Gain margin is.
  - a) Zero
  - b) -1dB
  - c) 1dB
  - d) Infinity
- 3) The compensator required to improve the steady- state response of a system is.
  - a) lag
  - b) Lead
  - c) lag-lead
  - d) none of these
- 4) Consider the loop transfer function  $K(s+6)/(s+3)(s+5)$  In the root locus diagram the centroid will be located at.
  - a) -4
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- 5) The frequency at which the phase of the system acquires \_\_\_\_\_ is known as 'Phase crossover frequency'.
  - a)  $90^\circ$
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- 6) Which condition is used to verify the existence of a particular point on the root locus?
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**CONTROL SYSTEMS**

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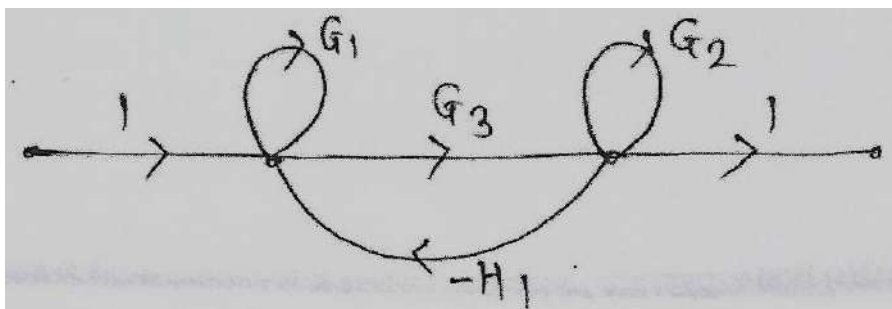
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- a) Derive transfer function of armature controlled DC servomotor.
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- c) Define following terms with reference to SFG
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  - 3) Self loop
  - 4) Non-touching loops
- d) Determine the acceleration and velocity constant for the system having.
 
$$G(S) = \frac{1}{s(s+4)} \quad H(S) = \frac{s}{(\delta+s)}$$
- e) Explain DC servo motor with neat diagram.

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

- a) Write any six block diagram reduction rules to obtain overall transfer function of system.
- b) Determine the overall transfer function for the following system shown with the help of SFG using Mason's Gain formula.



- c) Determine the following transient parameters for the Second order system having characteristic equation  $S^2 + 6S + 25 = 0$ 
  - 1) Maximum peak overshoot
  - 2) damped frequency
  - 3) Settling time at 5% tolerance band
  - 4) damping factor

## Section – II

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

- a) Sketch the polar plot for the following system.

$$G(s)H(s) = \frac{(s + 10)}{(s + 1)}$$

- b) Determine the stability of the system for following characteristic equation by Hurwitz's method.

$$F(s) = s^3 + s^2 + s + 4 = 0$$

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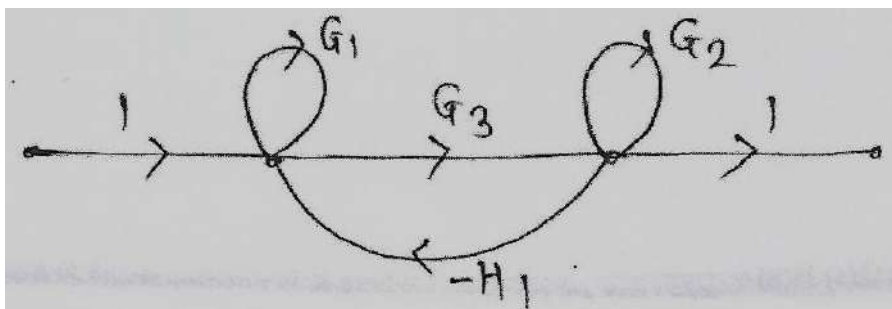
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Duration: 30 Minutes

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  - c) Magnitude
  - d) Angle
- 5) Due to an addition of pole at origin, the polar plot gets shifted by \_\_\_\_\_ at  $\omega = 0$ ?
  - a)  $-45^\circ$
  - b)  $-60^\circ$
  - c)  $-90^\circ$
  - d)  $-180^\circ$
- 6) The transient response of feedback system with damping factor zero \_\_\_\_\_.
  - a) Rises slowly
  - b) Rises quickly
  - c) Decays quickly
  - d) None of these
- 7) A node having only incoming branches is called as \_\_\_\_\_.
  - a) Source node
  - b) Sink node
  - c) Output node
  - d) Both b and c
- 8) The steady state error due to ramp input for a type zero system is equal to \_\_\_\_\_.
  - a) Zero
  - b) Infinite
  - c) Non zero number
  - d) Constant



Seat  
No.

**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**CONTROL SYSTEMS**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

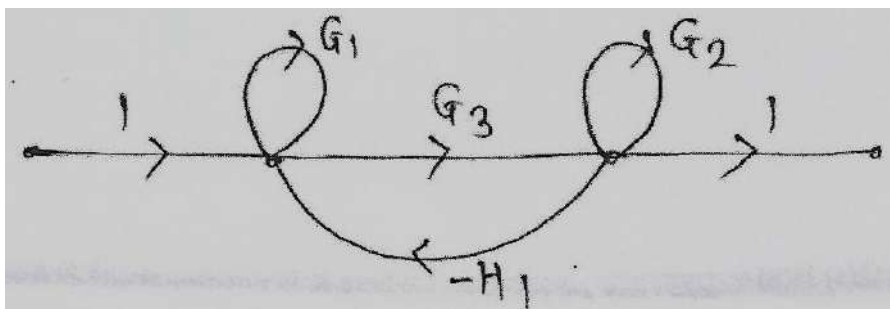
**Section – I**

**Q.2 Solve any four.** **16**

- a) Derive transfer function of armature controlled DC servomotor.
- b) Differentiate between open loop & closed loop control systems.
- c) Define following terms with reference to SFG
  - 1) Source node
  - 2) Forward path
  - 3) Self loop
  - 4) Non-touching loops
- d) Determine the acceleration and velocity constant for the system having.
 
$$G(S) = \frac{1}{s(s+4)} \quad H(S) = \frac{s}{(\delta+s)}$$
- e) Explain DC servo motor with neat diagram.

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

- a) Write any six block diagram reduction rules to obtain overall transfer function of system.
- b) Determine the overall transfer function for the following system shown with the help of SFG using Mason's Gain formula.



- c) Determine the following transient parameters for the Second order system having characteristic equation  $S^2 + 6S + 25 = 0$ 
  - 1) Maximum peak overshoot
  - 2) damped frequency
  - 3) Settling time at 5% tolerance band
  - 4) damping factor

## Section – II

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

- a) Sketch the polar plot for the following system.

$$G(s)H(s) = \frac{(s + 10)}{(s + 1)}$$

- b) Determine the stability of the system for following characteristic equation by Hurwitz method.

$$F(s) = s^3 + s^2 + s + 4 = 0$$

- c) What is necessity of compensator? Explain lead compensator.  
 d) Define absolute stability and conditionally stability of the system.  
 e) Find the forced sinusoidal response for following system  $G(s) = \frac{(s+1)}{(s+2)}$  for the input signal  $r(t) = 10 \cos(2t + 45^\circ)$

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

- a) Sketch the root locus for the system.

$$G(s) = \frac{K(s + 1)}{s(s + 2)}$$

- b) Explain the nature of Bode plots for.

- 1) System gain 'K'
- 2) Poles at origin
- 3) Zeros at origin

- c) A system has  $G(s)H(s) = \frac{K}{s(s+2)(s+4)(s+8)}$ , where K is positive. Determine the range of K for stability using Routh's criterion.

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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.  
 4) Use of only on programmable calculator is allowed.  
 5) Draw neat labeled diagrams 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 value of the twiddle factor  $W_8^{13}$  is \_\_\_\_\_.
  - a)  $-j$
  - b)  $1$
  - c)  $-0.707 + j 0.707$
  - d)  $j$
- 2) In DIT, the data  $x(n)$  is stored in \_\_\_\_\_ order.
  - a) Reversed order
  - b) Bit reversal
  - c) Non-Shuffled
  - d) None
- 3) Each butterfly operation involves \_\_\_\_\_ complex multiplication.
  - a) One
  - b) Two
  - c) Three
  - d) None
- 4) Product of two DFTs is equivalent to \_\_\_\_\_ of corresponding time domain sequences.
  - a) Cross correlation
  - b) Circular convolution
  - c) Linear convolution
  - d) Auto correlation
- 5) For a decimation-in-frequency FFT algorithm, which of the following is true?
  - a) Both input and output are in order
  - b) Both input and output are shuffled
  - c) Input is shuffled and output is in order
  - d) Input is in order and output is shuffled
- 6) How many delay elements are available in direct form I realization of  $Y(n) = 0.5y(n-1) - 0.25y(n-2) + x(n) + 0.4x(n-1)$ .
  - a) 4
  - b) 3
  - c) 2
  - d) 1
- 7) The DFT of the signal  $x[n] = \{1, 1, 0, 0\}$  is \_\_\_\_\_.
  - a)  $\{2, 1+j, 0, 1-j\}$
  - b)  $\{2, 0, 0, 0\}$
  - c)  $\{2, 2-2j, 0, 2+2j\}$
  - d)  $\{2, 1-j, 0, 1+j\}$
- 8) With repetitive MAC operations, the accumulator sum grows. The bits used to handle this growth are \_\_\_\_\_.
  - a) Parity bit
  - b) Extra bits
  - c) Guard bits
  - d) Overflow errors

- 9) In impulse invariant transformation, relation between  $\Omega$  and  $\omega$  is \_\_\_\_\_.
- |                              |                                      |
|------------------------------|--------------------------------------|
| a) $\Omega = \omega T$       | b) $\Omega = \omega / T$             |
| c) $\Omega = \tan(\Omega T)$ | d) $\Omega = (T/2) \tan(\omega T/2)$ |
- 10) Which method of FIR filter design can lead to Linear phase characteristic \_\_\_\_\_?
- |               |                       |
|---------------|-----------------------|
| a) Windowing  | b) Frequency sampling |
| c) Both a & b | d) None of these      |
- 11) Non linearity in the relationship between  $\Omega$  and  $\omega$  is known as \_\_\_\_\_.
- |              |                      |
|--------------|----------------------|
| a) Aliasing  | b) Frequency warping |
| c) Unwarping | d) Frequency mixing  |
- 12) Butterworth filters have \_\_\_\_\_.
- |                                     |                            |
|-------------------------------------|----------------------------|
| a) Wide transition region           | b) Sharp transition region |
| c) Oscillation in transition region | d) Maximally flat passband |
- 13) The addressing mode that is convenient for FFT computation is \_\_\_\_\_.
- |                            |                             |
|----------------------------|-----------------------------|
| a) Indirect addressing     | b) Circular mode addressing |
| c) Bit reversed addressing | d) Memory mapped addressing |
- 14) The poles of the Butterworth LPF with cutoff frequency  $\Omega_c$  \_\_\_\_\_.
- |   |                              |
|---|------------------------------|
| a) lie on the unit circle in s plane    | b) lie on the RHS of s plane |
| c) lie on a circle of radius $\Omega_c$ | d) none of these             |



Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Assume suitable data if necessary.  
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 4) Draw neat labeled diagrams whenever necessary.

**Section – I**

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

- a) Find 4 point DFT of the sequence  $x(n) = \{1, 1, 0, 0\}$  using direct computation.
- b) List the properties of DFT.
- c) Draw and explain the block diagram of DSP system
- d) Obtain the cascade realization of the system characterized by transfer function.

$$H(Z) = \frac{z(z-1)}{z^2 - 0.2z - 0.15}$$

- e) Explain the procedure to find IDFT by DIT FFT algorithm.

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

- a) Compute the convolution of following using overlap add algorithm  $x(n) = \{2, 0, -2, 0, 2, 1, 0, -2, -1\}$  and  $h(n) = \{3, 2, 1\}$ .
- b) Calculate 4 point DFT values of the sequence  $x[n] = \{1, 2, 3, 4\}$
- c) Find the IDFT for the given DFT using matrix method.  
 $X(k) = \{6, -2+2j, -2, -2-2j\}$

**Section-II**

**Q.4 Solve any four of the following questions. 16**

- a) Explain finite word length effect in FIR filters.
- b) Explain in brief the basic building blocks of digital signal processor.
- c) Write the analog transfer function for Butterworth filter of order 2 & cutoff frequency  $\Omega_c = 1$ .

Using frequency transformations convert above filter to

- i) Low pass filter with cutoff frequency  $\Omega_c' = 0.45$
- ii) High pass filter with cutoff frequency  $\Omega_c' = 1.24$ .

- d) Describe the applications of DSP in Image processing.
- e) Explain in detail the multiply and Accumulate (MAC) unit of digital signal processor.
- f) Convert the analog filter to digital filter whose system function is

$$H(S) = \frac{s}{s^2 + 5s + 6}$$

Use Impulse invariant method. Assume  $T=1s$ .

**Q.5 Solve any two of the following questions.**

- a) Explain the Bilinear transformation for digital filters in detail
- b) Explain the Windowing technique for FIR filter design along with different window functions.
- c) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} 1 & -\frac{\pi}{2} \leq \omega \leq \pi/2 \\ 0 & \frac{\pi}{2} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric rectangular window with window length 5.



- 9) In DIT, the data  $x(n)$  is stored in \_\_\_\_\_ order.
- a) Reversed order                      b) Bit reversal  
c) Non-Shuffled                         d) None
- 10) Each butterfly operation involves \_\_\_\_\_ complex multiplication.
- a) One                                        b) Two  
c) Three                                     d) None
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- a) Cross correlation                      b) Circular convolution  
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c) 2    d) 1
- 14) The DFT of the signal  $x[n] = \{1, 1, 0, 0\}$  is \_\_\_\_\_.
- a)  $\{2, 1+j, 0, 1-j\}$                       b)  $\{2, 0, 0, 0\}$   
c)  $\{2, 2-2j, 0, 2+2j\}$                     d)  $\{2, 1-j, 0, 1+j\}$

Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

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

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Use Impulse invariant method. Assume  $T=1s$ .

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$$H_d(e^{j\omega}) = \begin{cases} 1 & -\frac{\pi}{2} \leq \omega \leq \pi/2 \\ 0 & \frac{\pi}{2} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric rectangular window with window length 5.

Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 70

- 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

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- 1) For a decimation-in-frequency FFT algorithm, which of the following is true?
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- 4) With repetitive MAC operations, the accumulator sum grows. The bits used to handle this growth are \_\_\_\_\_.
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  - c) Guard bits
  - d) Overflow errors
- 5) In impulse invariant transformation, relation between  $\Omega$  and  $\omega$  is \_\_\_\_\_.
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c)  $-0.707 + j 0.707$                       d)  $j$
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- a) One    b) Two  
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- 14) Product of two DFTs is equivalent to \_\_\_\_\_ of corresponding time domain sequences.
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Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

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**Section – I**

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- e) Explain the procedure to find IDFT by DIT FFT algorithm.

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 $X(k) = \{6, -2+2j, -2, -2-2j\}$

**Section-II**

**Q.4 Solve any four of the following questions. 16**

- a) Explain finite word length effect in FIR filters.
- b) Explain in brief the basic building blocks of digital signal processor.
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Using frequency transformations convert above filter to

- i) Low pass filter with cutoff frequency  $\Omega_c' = 0.45$
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- d) Describe the applications of DSP in Image processing.
- e) Explain in detail the multiply and Accumulate (MAC) unit of digital signal processor.
- f) Convert the analog filter to digital filter whose system function is

$$H(S) = \frac{s}{s^2 + 5s + 6}$$

Use Impulse invariant method. Assume  $T=1s$ .

**Q.5 Solve any two of the following questions.**

- a) Explain the Bilinear transformation for digital filters in detail
- b) Explain the Windowing technique for FIR filter design along with different window functions.
- c) The desired frequency response of a low pass filter is

$$H_d(e^{j\omega}) = \begin{cases} 1 & -\frac{\pi}{2} \leq \omega \leq \pi/2 \\ 0 & \frac{\pi}{2} \leq |\omega| \leq \pi \end{cases}$$

Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric rectangular window with window length 5.



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- 12) The DFT of the signal  $x[n] = \{1, 1, 0, 0\}$  is \_\_\_\_\_.
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- 13) With repetitive MAC operations, the accumulator sum grows. The bits used to handle this growth are \_\_\_\_\_.
- a) Parity bit                                      b) Extra bits  
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- 14) In impulse invariant transformation, relation between  $\Omega$  and  $\omega$  is \_\_\_\_\_.
- a)  $\Omega = \omega T$                                       b)  $\Omega = \omega / T$   
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**DIGITAL SIGNAL PROCESSING**

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

Max. Marks: 56

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**Section – I**

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**Section-II**

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- The desired frequency response of a low pass filter is

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Determine  $h_d(n)$ . Also determine  $h(n)$  using symmetric rectangular window with window length 5.



- 10) To increase resolution of DAC \_\_\_\_\_.
- a) Increase number of output bits
  - b) Use registers with better tolerance
  - c) Increase Vref
  - d) Use faster op-amp
- 11) For I/O mapped I/O, address lines used are \_\_\_\_\_.
- a) 10 bit
  - b) 8 bit
  - c) 16 bit
  - d) 4 bit
- 12) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is \_\_\_\_\_.
- a) mode 0
  - b) mode 1
  - c) mode 2
  - d) mode 3
- 13) In control word format of 8253, if RL1=1, RL0=1 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) In BSR mode, only port C can be used to \_\_\_\_\_.
- a) set individual ports
  - b) reset individual ports
  - c) set and reset individual ports
  - d) programmable I/O ports



Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**MICROPROCESSOR AND INTERFACING**

Day & Date: Wednesday, 11-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data wherever necessary.

**Section – I**

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

- a) Define addressing mode. Explain addressing mode in 8085 with example.
- b) Draw the timing diagram of instruction MVI A, 05h.
- c) Write an assembly program to add ten numbers. Explain the key instruction used in the program.
- d) Write a program to count the positive numbers from the given array of 10 elements.
- e) Explain different types of memory.

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

- a) Explain interrupt structure with a neat sketch.
- b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H.
- c) Write a program to convert two digit BCD number to its equivalent hex number.

**Section – II**

**Q.4 Answer any four of the following questions. 16**

- a) Draw the block diagram of 8255 and explain it.
- b) Compare I/O mapped I/O and memory mapped I/O interfacing.
- c) Draw and explain R-2R DAC.
- d) Explain in detail modes of PPI 8251.
- e) Explain SIM and RIM instructions.

**Q.5 Answer any two of the following questions. 12**

- a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.
- b) Interface stepper motor to the 8085. Write a program to rotate the stepper motor for five rotations.
- c) Interface timer 8253 to the 8085 from address 20h. Explain modes of operations of 8253.

Seat No.	
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Q
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**Electronics Engineering**  
**MICROPROCESSOR AND INTERFACING**

Day & Date: Wednesday, 11-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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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 bit of control word of 8255 decides either BSR or I/O mode?
  - a) D4
  - b) D0
  - c) D6
  - d) D7
- 2) The 8253 mode 0 is \_\_\_\_\_.
  - a) Interrupt on terminal count
  - b) H/W retriggerable one shot
  - c) Rate generator
  - d) Square wave generator
- 3) To increase resolution of DAC \_\_\_\_\_.
  - a) Increase number of output bits
  - b) Use registers with better tolerance
  - c) Increase Vref
  - d) Use faster op-amp
- 4) For I/O mapped I/O, address lines used are \_\_\_\_\_.
  - a) 10 bit
  - b) 8 bit
  - c) 16 bit
  - d) 4 bit
- 5) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is \_\_\_\_\_.
  - a) mode 0
  - b) mode 1
  - c) mode 2
  - d) mode 3
- 6) In control word format of 8253, if RL1=1, RL0=1 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) In BSR mode, only port C can be used to \_\_\_\_\_.
  - a) set individual ports
  - b) reset individual ports
  - c) set and reset individual ports
  - d) programmable I/O ports
- 8) The instruction "LDA 9000" requires \_\_\_\_\_.
  - a) 13
  - b) 7
  - c) 10
  - d) 18



Seat No.	
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**Section – I**

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

- a) Define addressing mode. Explain addressing mode in 8085 with example.
- b) Draw the timing diagram of instruction MVI A, 05h.
- c) Write an assembly program to add ten numbers. Explain the key instruction used in the program.
- d) Write a program to count the positive numbers from the given array of 10 elements.
- e) Explain different types of memory.

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

- a) Explain interrupt structure with a neat sketch.
- b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H.
- c) Write a program to convert two digit BCD number to its equivalent hex number.

**Section – II**

**Q.4 Answer any four of the following questions. 16**

- a) Draw the block diagram of 8255 and explain it.
- b) Compare I/O mapped I/O and memory mapped I/O interfacing.
- c) Draw and explain R-2R DAC.
- d) Explain in detail modes of PPI 8251.
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- a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.
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Seat No.	
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Set **R**

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**MICROPROCESSOR AND INTERFACING**

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Max. Marks: 70

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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) When READY pin of 8085 microprocessor is low \_\_\_\_\_.  
 a) the processor will be ready to execute program  
 b) the processor will enter into wait state for one clock period  
 c) the processor will enter into wait state until the READY pin is made high  
 d) the processor will return back from its READY state
- 2) Addressing in which the instructions contains the address of the data to the operated on is known as \_\_\_\_\_.  
 a) immediate addressing                      b) implied addressing  
 c) register addressing                         d) direct addressing
- 3) The stack is a specialized temporary \_\_\_\_\_ access memory during \_\_\_\_\_ and \_\_\_\_\_ instructions.  
 a) random, store, load                         b) random, push, load  
 c) sequential, store, pop                        d) sequential, push, pop
- 4) Which bit of control word of 8255 decides either BSR or I/O mode?  
 a) D4     b) D0  
 c) D6     d) D7
- 5) The 8253 mode 0 is \_\_\_\_\_.  
 a) Interrupt on terminal count                 b) H/W retriggerable one shot  
 c) Rate generator                                 d) Square wave generator
- 6) To increase resolution of DAC \_\_\_\_\_.  
 a) Increase number of output bits  
 b) Use registers with better tolerance  
 c) Increase Vref  
 d) Use faster op-amp
- 7) For I/O mapped I/O, address lines used are \_\_\_\_\_.  
 a) 10 bit    b) 8 bit  
 c) 16 bit    d) 4 bit
- 8) The mode of 8253 that is used to interrupt the processor by setting a suitable terminal count is \_\_\_\_\_.  
 a) mode 0    b) mode 1  
 c) mode 2    d) mode 3

- 9) In control word format of 8253, if RL1=1, RL0=1 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) In BSR mode, only port C can be used to \_\_\_\_\_.
- a) set individual ports
  - b) reset individual ports
  - c) set and reset individual ports
  - d) programmable I/O ports
- 11) The instruction "LDA 9000" requires \_\_\_\_\_.
- a) 13
  - b) 7
  - c) 10
  - d) 18
- 12) Vector location of TRAP interrupt is \_\_\_\_\_ T- states.
- a) 0024H
  - b) 002CH
  - c) 0034H
  - d) 003CH
- 13) The contents of accumulator before CMA instruction is A5H. Its content after instruction execution is \_\_\_\_\_.
- a) A5H
  - b) 5AH
  - c) AAH
  - d) 55H23
- 14) The synchronization between microprocessor and memory is done by \_\_\_\_\_.
- a) ALE signal
  - b) HOLD signal
  - c) READY signal
  - d) None of these

Seat No.	
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**MICROPROCESSOR AND INTERFACING**

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Max. Marks: 56

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**Section – I**

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

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- b) Draw the timing diagram of instruction MVI A, 05h.
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- d) Write a program to count the positive numbers from the given array of 10 elements.
- e) Explain different types of memory.

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

- a) Explain interrupt structure with a neat sketch.
- b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H.
- c) Write a program to convert two digit BCD number to its equivalent hex number.

**Section – II**

**Q.4 Answer any four of the following questions. 16**

- a) Draw the block diagram of 8255 and explain it.
- b) Compare I/O mapped I/O and memory mapped I/O interfacing.
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- d) Explain in detail modes of PPI 8251.
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**Q.5 Answer any two of the following questions. 12**

- a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.
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- c) Interface timer 8253 to the 8085 from address 20h. Explain modes of operations of 8253.







Seat No.	
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Set **S**

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**MICROPROCESSOR AND INTERFACING**

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Max. Marks: 56

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**Section – I**

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

- a) Define addressing mode. Explain addressing mode in 8085 with example.
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- c) Write an assembly program to add ten numbers. Explain the key instruction used in the program.
- d) Write a program to count the positive numbers from the given array of 10 elements.
- e) Explain different types of memory.

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- a) Explain interrupt structure with a neat sketch.
- b) Design a 8085 microprocessor based system with 8 KB EPROM having a word length of 8-bits with the starting address of 0000H and two 2KB RAMs having word lengths of 8-bits each with starting address of 4000H.
- c) Write a program to convert two digit BCD number to its equivalent hex number.

**Section – II**

**Q.4 Answer any four of the following questions. 16**

- a) Draw the block diagram of 8255 and explain it.
- b) Compare I/O mapped I/O and memory mapped I/O interfacing.
- c) Draw and explain R-2R DAC.
- d) Explain in detail modes of PPI 8251.
- e) Explain SIM and RIM instructions.

**Q.5 Answer any two of the following questions. 12**

- a) Interface ADC 0808 to 8085 and write a program for analog to digital conversion.
- b) Interface stepper motor to the 8085. Write a program to rotate the stepper motor for five rotations.
- c) Interface timer 8253 to the 8085 from address 20h. Explain modes of operations of 8253.

Seat No.	
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Set **P**

**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.  
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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 of the following is/are scalar quantity(s)?
  - a) distance
  - b) density
  - c) temperature
  - d) all of these
- 2) A vector  $\vec{P}$  in Cartesian coordinates is represented by \_\_\_\_\_.
  - a)  $(P_x, P_\phi, P_z)$
  - b)  $(P_x, P_y, P_z)$
  - c)  $(P_x, P_\phi, P_\theta)$
  - d) none of these
- 3) Multiplication of two vectors is \_\_\_\_\_.
  - a) vector
  - b) scalar
  - c) either vector or scalar
  - d) cannot say
- 4) Cylindrical coordinate 'z' is related to the Cartesian coordinate as \_\_\_\_\_.
  - a)  $\tan^{-1}(y/x)$
  - b) z
  - c)  $xy/z$
  - d)  $\cot z$
- 5) Curl measures \_\_\_\_\_.
  - a) rate of change of vector
  - b) circular rotation
  - c) both (a) and (b)
  - d) none of these
- 6) Unit of electric intensity is \_\_\_\_\_.
  - a) joules / coulomb
  - b) newton / coulomb
  - c) volt / meter
  - d) both (b) and (c)
- 7) The force between two point charges of 1 nC each with a 1 mm separation in air is \_\_\_\_\_.
  - a)  $9 \times 10^{-3} \text{N}$
  - b)  $9 \times 10^{-6} \text{N}$
  - c)  $9 \times 10^{-9} \text{N}$
  - d)  $9 \times 10^{-12} \text{N}$
- 8) \_\_\_\_\_ gradient of magnetic scalar potential gives magnetic field intensity.
  - a) Positive
  - b) Negative
  - c) Double
  - d) Integral
- 9) Maxwell's equations in \_\_\_\_\_ form give unformation at points of discontinuity in electromagnetic fields.
  - a) Differential
  - b) Integral
  - c) Algebraic
  - d) None of these



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

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

- a) Given  $A = \hat{a}_x + \hat{a}_y$  and  $B = \hat{a}_x + 2\hat{a}_y - 2\hat{a}_z$ , Find the angle between them.
- b) State and Explain Stokes theorem.
- c) Point charge of  $Q=0.5\mu\text{C}$  located at origin, Find E at (0,3,4)m.
- d) Explain differential components for cylindrical system.
- e) Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions. 12**

- a) A pair of 200 mm long concentric conductor of radius of 50mm and 100mm is applied with dielectric  $10\epsilon_0$ . A voltage is applied between conductors to established dielectric field  $E = (10/r)^6 a_r$  V/m, between the cylinders calculated energy stored.
- b) Derive the expression for magnetic field intensity due to infinite length current carrying filament.
- c) State and explain point form of Gauss's Law.

**Section – II**

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

- a) Derive the wave equation for electric field and magnetic field in Lossless medium.
- b) Define the term displacement current and conduction current.
- c) Derive the transmission line equation stating with field theory.
- d) Define Directive Gain and Directivity of antenna.
- e) A signal of 10 V is applied to a  $50\Omega$  coaxial transmission line terminated in  $200\Omega$  load. Find reflection coefficient and magnitude of reflected voltage.

**Q.5 Answer any two questions. 12**

- a) Derive the expression for radiation fields of current element.
- b) State and derive Poynting theorem and give its significance.
- c) Derive the equation for reflection coefficient and transmission coefficient in terms of load impedance and characteristic impedance for terminated transmission line.

Seat No.	
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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) \_\_\_\_\_ gradient of magnetic scalar potential gives magnetic field intensity.
  - a) Positive
  - b) Negative
  - c) Double
  - d) Integral
- 2) Maxwell's equations in \_\_\_\_\_ form give information at points of discontinuity in electromagnetic fields.
  - a) Differential
  - b) Integral
  - c) Algebraic
  - d) None of these
- 3) Phase velocity is given as \_\_\_\_\_.
  - a)  $\omega\beta$
  - b)  $\beta\omega$
  - c)  $\beta/\omega$
  - d) None of these
- 4) Standing wave consists of two travelling waves of \_\_\_\_\_ amplitudes and \_\_\_\_\_ is direction.
  - a) Unequal, same
  - b) Unequal, opposite
  - c) Equal, same
  - d) Equal, opposite
- 5) Transmission coefficient is given as \_\_\_\_\_.
  - a)  $\frac{\eta_1}{\eta_1 + \eta_2}$
  - b) None of these
  - c)  $\frac{\eta_1 + \eta_2}{2\eta_2}$
  - d)  $\frac{\eta_1 + \eta_2}{2\eta_1}$
- 6) If antenna directivity and antenna gain are equal, then antenna efficiency is \_\_\_\_\_%.
  - a) 20
  - b) 50
  - c) 75
  - d) 100
- 7) If antenna array elemental spacing is large, then directivity will be \_\_\_\_\_.
  - a) Small
  - b) More
  - c) None of these
  - d) Cannot say
- 8) Which of the following is/are scalar quantity(s)?
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- b) State and Explain Stokes theorem.
- c) Point charge of  $Q=0.5\mu\text{C}$  located at origin, Find E at (0,3,4)m.
- d) Explain differential components for cylindrical system.
- e) Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions. 12**

- a) A pair of 200 mm long concentric conductor of radius of 50mm and 100mm is applied with dielectric  $10\epsilon_0$ . A voltage is applied between conductors to established dielectric field  $E = (10/r)^6 a_r$  V/m, between the cylinders calculated energy stored.
- b) Derive the expression for magnetic field intensity due to infinite length current carrying filament.
- c) State and explain point form of Gauss's Law.

**Section – II**

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

- a) Derive the wave equation for electric field and magnetic field in Lossless medium.
- b) Define the term displacement current and conduction current.
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- d) Define Directive Gain and Directivity of antenna.
- e) A signal of 10 V is applied to a  $50\Omega$  coaxial transmission line terminated in  $200\Omega$  load. Find reflection coefficient and magnitude of reflected voltage.

**Q.5 Answer any two questions. 12**

- a) Derive the expression for radiation fields of current element.
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**MCQ/Objective Type Questions**

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- 1) Curl measures \_\_\_\_\_.
  - a) rate of change of vector
  - b) circular rotation
  - c) both (a) and (b)
  - d) none of these
- 2) Unit of electric intensity is \_\_\_\_\_.
  - a) joules / coulomb
  - b) newton / coulomb
  - c) volt / meter
  - d) both (b) and (c)
- 3) The force between two point charges of 1 nC each with a 1 mm separation in air is \_\_\_\_\_.
  - a)  $9 \times 10^{-3} \text{N}$
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- 7) Standing wave consists of two travelling waves of \_\_\_\_\_ amplitudes and \_\_\_\_\_ is direction.
  - a) Unequal, same
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  - a)  $\frac{\eta_1}{\eta_1 + \eta_2}$
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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) Phase velocity is given as \_\_\_\_\_.
  - a)  $\omega\beta$
  - b)  $\beta\omega$
  - c)  $\beta/\omega$
  - d) None of these
- 2) Standing wave consists of two travelling waves of \_\_\_\_\_ amplitudes and \_\_\_\_\_ is direction.
  - a) Unequal, same
  - b) Unequal, opposite
  - c) Equal, same
  - d) Equal, opposite
- 3) Transmission coefficient is given as \_\_\_\_\_.
  - a)  $\frac{\eta_1}{\eta_1 + \eta_2}$
  - b) None of these
  - c)  $\frac{\eta_1 + \eta_2}{2\eta_2}$
  - d)  $\frac{\eta_1 + \eta_2}{2\eta_1}$
- 4) If antenna directivity and antenna gain are equal, then antenna efficiency is \_\_\_\_\_.
  - a) 20
  - b) 50
  - c) 75
  - d) 100
- 5) If antenna array elemental spacing is large, then directivity will be \_\_\_\_\_.
  - a) Small
  - b) More
  - c) None of these
  - d) Cannot say
- 6) Which of the following is/are scalar quantity(s)?
  - a) distance
  - b) density
  - c) temperature
  - d) all of these
- 7) A vector  $\vec{P}$  in Cartesian coordinates is represented by \_\_\_\_\_.
  - a)  $(P_x, P_\phi, P_z)$
  - b)  $(P_x, P_y, P_z)$
  - c)  $(P_x, P_\phi, P_\theta)$
  - d) none of these
- 8) Multiplication of two vectors is \_\_\_\_\_.
  - a) vector
  - b) scalar
  - c) either vector or scalar
  - d) cannot say



Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**ELECTROMAGNETIC ENGINEERING**

Day & Date: Friday, 13-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

**Instructions:** 1) All questions are compulsory.  
 2) Figure to the right indicates full marks.

**Section – I**

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

- a) Given  $A = \hat{a}_x + \hat{a}_y$  and  $B = \hat{a}_x + 2\hat{a}_y - 2\hat{a}_z$ , Find the angle between them.
- b) State and Explain Stokes theorem.
- c) Point charge of  $Q=0.5\mu\text{C}$  located at origin, Find E at (0,3,4)m.
- d) Explain differential components for cylindrical system.
- e) Derive the Lorentz's force equation for moving charges.

**Q.3 Answer any two questions. 12**

- a) A pair of 200 mm long concentric conductor of radius of 50mm and 100mm is applied with dielectric  $10\epsilon_0$ . A voltage is applied between conductors to established dielectric field  $E = (10/r)^6 a_r$  V/m, between the cylinders calculated energy stored.
- b) Derive the expression for magnetic field intensity due to infinite length current carrying filament.
- c) State and explain point form of Gauss's Law.

**Section – II**

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

- a) Derive the wave equation for electric field and magnetic field in Lossless medium.
- b) Define the term displacement current and conduction current.
- c) Derive the transmission line equation stating with field theory.
- d) Define Directive Gain and Directivity of antenna.
- e) A signal of 10 V is applied to a  $50\Omega$  coaxial transmission line terminated in  $200\Omega$  load. Find reflection coefficient and magnitude of reflected voltage.

**Q.5 Answer any two questions. 12**

- a) Derive the expression for radiation fields of current element.
- b) State and derive Poynting theorem and give its significance.
- c) Derive the equation for reflection coefficient and transmission coefficient in terms of load impedance and characteristic impedance for terminated transmission line.

Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- 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.**

**14**

- 1) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
  - a) Information technology
  - b) Cloud computing
  - c) Web services
  - d) Apps
- 2) The ten knowledge areas, each of which contains some or all of the project management processes, is called \_\_\_\_\_.
  - a) SDLC
  - b) management document
  - c) PMBOK
  - d) None of these
- 3) Take odd man out- MS Project, MS Access, DB2, Oracle
  - a) MS Word
  - b) MS Access
  - c) DB2
  - d) Oracle
- 4) An IT project can produce \_\_\_\_\_.
  - a) system
  - b) software
  - c) recommendations
  - d) all of these
- 5) Take odd man out - tuple, relation, attribute, query
  - a) tuple
  - b) relation
  - c) attribute
  - d) query
- 6) A \_\_\_\_\_ is a product or outcome that is given to the client.
  - a) milestone
  - b) SDLC
  - c) waterfall
  - d) none of these
- 7) What for IS & IT are used in Digital Enterprises?
  - a) Research
  - b) Boost employee productivity
  - c) customer support
  - d) All of these
- 8) Select appropriate sequence.
  - a) database, data, knowledge, information
  - b) data, database, knowledge, information
  - c) data, database, information, knowledge
  - d) information, database, knowledge, data
- 9) Organizations sell products to other organizations electronically is called \_\_\_\_\_ marketplace.
  - a) buy side
  - b) sell side
  - c) virtual
  - d) electronic exchange

- 10) Which of below is an example of TPS?  
a) business intelligence                      b) Payroll  
c) ERP    d) expert system
- 11) Which of below is a major disadvantage of a centralized database?  
a) expensive                                      b) requires scheduling  
c) causes delays                                d) all of these
- 12) The major cost incurred in implementing ERP is due to \_\_\_\_\_.  
a) hardware                                      b) software  
c) training                                        d) reengineering
- 13) Which of below is not a function of DBMS?  
a) quality                                         b) synch  
c) enrichment                                    d) forecasting
- 14) A person having a insight of specific functional area of project is called \_\_\_\_\_.  
a) project manager                              b) technical expert  
c) software engineer                             d) subject matter expert



Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any Two.** **12**
- a) Explain partitioned database with - diagram, advantages and disadvantages.
  - b) With one suitable application discuss electronic content management in detail.
  - c) Discuss any one type of cloud computing in detail.
- Q.3 Solve Any Four.** **16**
- a) Differentiate - data mart Vs data warehouse.
  - b) Discuss benefits of E Commerce to organizations.
  - c) Justify with example - IT flattens organization structure.
  - d) With suitable example explain B2C and C2B transactions.
  - e) To whom IT supports in a typical organization?

**Section – II**

- Q.4 Solve any Two.** **12**
- a) With suitable example explain need of software project management.
  - b) What is Project Management Body of Knowledge?
  - c) With suitable example explain deliverables and milestones.
- Q.5 Solve any Four.** **16**
- a) Evaluate – Green IT.
  - b) Discuss ethical issues related to information systems.
  - c) Explain economical impact of IS on organization.
  - d) What are the causes of software project overrun?
  - e) Discuss waterfall SDLC model.

Seat No.	
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Set **Q**

**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- 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.**

**14**

- 1) Select appropriate sequence.
  - a) database, data, knowledge, information
  - b) data, database, knowledge, information
  - c) data, database, information, knowledge
  - d) information, database, knowledge, data
- 2) Organizations sell products to other organizations electronically is called \_\_\_\_\_ marketplace.
  - a) buy side
  - b) sell side
  - c) virtual
  - d) electronic exchange
- 3) Which of below is an example of TPS?
  - a) business intelligence
  - b) Payroll
  - c) ERP
  - d) expert system
- 4) Which of below is a major disadvantage of a centralized database?
  - a) expensive
  - b) requires scheduling
  - c) causes delays
  - d) all of these
- 5) The major cost incurred in implementing ERP is due to \_\_\_\_\_.
  - a) hardware
  - b) software
  - c) training
  - d) reengineering
- 6) Which of below is not a function of DBMS?
  - a) quality
  - b) synch
  - c) enrichment
  - d) forecasting
- 7) A person having a insight of specific functional area of project is called \_\_\_\_\_.
  - a) project manager
  - b) technical expert
  - c) software engineer
  - d) subject matter expert
- 8) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
  - a) Information technology
  - b) Cloud computing
  - c) Web services
  - d) Apps
- 9) The ten knowledge areas, each of which contains some or all of the project management processes, is called \_\_\_\_\_.
  - a) SDLC
  - b) management document
  - c) PMBOK
  - d) None of these



Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any Two. 12**
- a) Explain partitioned database with - diagram, advantages and disadvantages.
  - b) With one suitable application discuss electronic content management in detail.
  - c) Discuss any one type of cloud computing in detail.
- Q.3 Solve Any Four. 16**
- a) Differentiate - data mart Vs data warehouse.
  - b) Discuss benefits of E Commerce to organizations.
  - c) Justify with example - IT flattens organization structure.
  - d) With suitable example explain B2C and C2B transactions.
  - e) To whom IT supports in a typical organization?

**Section – II**

- Q.4 Solve any Two. 12**
- a) With suitable example explain need of software project management.
  - b) What is Project Management Body of Knowledge?
  - c) With suitable example explain deliverables and milestones.
- Q.5 Solve any Four. 16**
- a) Evaluate – Green IT.
  - b) Discuss ethical issues related to information systems.
  - c) Explain economical impact of IS on organization.
  - d) What are the causes of software project overrun?
  - e) Discuss waterfall SDLC model.

Seat No.	
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Set **R**

**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- 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.**

**14**

- 1) Take odd man out - tuple, relation, attribute, query
  - a) tuple
  - b) relation
  - c) attribute
  - d) query
- 2) A \_\_\_\_\_ is a product or outcome that is given to the client.
  - a) milestone
  - b) SDLC
  - c) waterfall
  - d) none of these
- 3) What for IS & IT are used in Digital Enterprises?
  - a) Research
  - b) Boost employee productivity
  - c) customer support
  - d) All of these
- 4) Select appropriate sequence.
  - a) database, data, knowledge, information
  - b) data, database, knowledge, information
  - c) data, database, information, knowledge
  - d) information, database, knowledge, data
- 5) Organizations sell products to other organizations electronically is called \_\_\_\_\_ marketplace.
  - a) buy side
  - b) sell side
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  - d) electronic exchange
- 6) Which of below is an example of TPS?
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  - b) Payroll
  - c) ERP
  - d) expert system
- 7) Which of below is a major disadvantage of a centralized database?
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  - b) requires scheduling
  - c) causes delays
  - d) all of these
- 8) The major cost incurred in implementing ERP is due to \_\_\_\_\_.
  - a) hardware
  - b) software
  - c) training
  - d) reengineering
- 9) Which of below is not a function of DBMS?
  - a) quality
  - b) synch
  - c) enrichment
  - d) forecasting

- 10) A person having a insight of specific functional area of project is called \_\_\_\_.
- |                      |                          |
|----------------------|--------------------------|
| a) project manager   | b) technical expert      |
| c) software engineer | d) subject matter expert |
- 11) \_\_\_\_ are software systems designed to support machine to machine interaction over a network.
- |                           |                    |
|---------------------------|--------------------|
| a) Information technology | b) Cloud computing |
| c) Web services           | d) Apps            |
- 12) The ten knowledge areas, each of which contains some or all of the project management processes, is called \_\_\_\_.
- |          |                        |
|----------|------------------------|
| a) SDLC  | b) management document |
| c) PMBOK | d) None of these       |
- 13) Take odd man out- MS Project, MS Access, DB2, Oracle
- |            |              |
|------------|--------------|
| a) MS Word | b) MS Access |
| c) DB2     | d) Oracle    |
- 14) An IT project can produce \_\_\_\_.
- |                    |                 |
|--------------------|-----------------|
| a) system          | b) software     |
| c) recommendations | d) all of these |

Seat No.	
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R
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any Two.** **12**
- a) Explain partitioned database with - diagram, advantages and disadvantages.
  - b) With one suitable application discuss electronic content management in detail.
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- Q.3 Solve Any Four.** **16**
- a) Differentiate - data mart Vs data warehouse.
  - b) Discuss benefits of E Commerce to organizations.
  - c) Justify with example - IT flattens organization structure.
  - d) With suitable example explain B2C and C2B transactions.
  - e) To whom IT supports in a typical organization?

**Section – II**

- Q.4 Solve any Two.** **12**
- a) With suitable example explain need of software project management.
  - b) What is Project Management Body of Knowledge?
  - c) With suitable example explain deliverables and milestones.
- Q.5 Solve any Four.** **16**
- a) Evaluate – Green IT.
  - b) Discuss ethical issues related to information systems.
  - c) Explain economical impact of IS on organization.
  - d) What are the causes of software project overrun?
  - e) Discuss waterfall SDLC model.

Seat No.	
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Set **S**

**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 70

- 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.**

**14**

- 1) Which of below is an example of TPS?
  - a) business intelligence
  - b) Payroll
  - c) ERP
  - d) expert system
- 2) Which of below is a major disadvantage of a centralized database?
  - a) expensive
  - b) requires scheduling
  - c) causes delays
  - d) all of these
- 3) The major cost incurred in implementing ERP is due to \_\_\_\_\_.
  - a) hardware
  - b) software
  - c) training
  - d) reengineering
- 4) Which of below is not a function of DBMS?
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  - b) synch
  - c) enrichment
  - d) forecasting
- 5) A person having a insight of specific functional area of project is called \_\_\_\_\_.
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  - b) technical expert
  - c) software engineer
  - d) subject matter expert
- 6) \_\_\_\_\_ are software systems designed to support machine to machine interaction over a network.
  - a) Information technology
  - b) Cloud computing
  - c) Web services
  - d) Apps
- 7) The ten knowledge areas, each of which contains some or all of the project management processes, is called \_\_\_\_\_.
  - a) SDLC
  - b) management document
  - c) PMBOK
  - d) None of these
- 8) Take odd man out- MS Project, MS Access, DB2, Oracle
  - a) MS Word
  - b) MS Access
  - c) DB2
  - d) Oracle
- 9) An IT project can produce \_\_\_\_\_.
  - a) system
  - b) software
  - c) recommendations
  - d) all of these





Seat No.	
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**T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019**  
**Electronics Engineering**  
**INFORMATION TECHNOLOGY & MANAGEMENT**

Day & Date: Monday, 16-12-2019  
 Time: 02:30 PM To 05:30 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.  
 2) Figures to the right indicate full marks.  
 3) Assume suitable data if necessary.

**Section – I**

- Q.2 Solve any Two. 12**
- a) Explain partitioned database with - diagram, advantages and disadvantages.
  - b) With one suitable application discuss electronic content management in detail.
  - c) Discuss any one type of cloud computing in detail.
- Q.3 Solve Any Four. 16**
- a) Differentiate - data mart Vs data warehouse.
  - b) Discuss benefits of E Commerce to organizations.
  - c) Justify with example - IT flattens organization structure.
  - d) With suitable example explain B2C and C2B transactions.
  - e) To whom IT supports in a typical organization?

**Section – II**

- Q.4 Solve any Two. 12**
- a) With suitable example explain need of software project management.
  - b) What is Project Management Body of Knowledge?
  - c) With suitable example explain deliverables and milestones.
- Q.5 Solve any Four. 16**
- a) Evaluate – Green IT.
  - b) Discuss ethical issues related to information systems.
  - c) Explain economical impact of IS on organization.
  - d) What are the causes of software project overrun?
  - e) Discuss waterfall SDLC model.