

Seat No.

# S.E. (Part - I) (E&TC) (CGPA) Examination, 2016 **ENGINEERING MATHEMATICS - III**

Day and Date: Tuesday, 13-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

- Instructions: 1) Attempt any three questions from each Section.
  - 2) Figures to right indicate full marks.
  - 3) Use of calculator is allowed.
  - 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 14

- 1. Choose the correct answer:
  - 1) The P.I. of  $(D + 1)^3 = e^{-x}$  is

a) 
$$x e^{-x}$$
 b)  $\frac{x^3}{3}e^{-x}$  c)  $\frac{x^2}{2}e^{-x}$ 

c) 
$$\frac{x^2}{2}e^{-x}$$

2)  $\frac{1}{D^2}x^3$  is equal to

b) 
$$e^{x}\left(x^{2} + \frac{x^{3}}{3}\right)$$
 c)  $\frac{x^{5}}{20}$ 

d) 
$$e^{-x} x^3$$

3) If f(t) is a periodic function of period T, then  $L\{f(t)\}$ 

a) 
$$\frac{1}{1-e^{-ST}} \int_{0}^{T} e^{-St} f(t) dt$$

b) 
$$\frac{1}{1-e^{ST}} \int_{0}^{T} e^{-St} f(t) dt$$

c) 
$$\frac{1}{1-e^{-ST}}\int_{0}^{\infty}e^{-St}f(t)dt$$

- d) None of these
- 4) The Laplace transform of  $\int_{0}^{1} \sin 2u du$  is

a) 
$$\frac{2}{S^2 + 4}$$
 b)  $\frac{2}{S^2}$ 

b) 
$$\frac{2}{s^2}$$

c) 
$$\frac{2}{S(S^2+4)}$$
 d)  $\frac{2}{(S^2+4)^2}$ 

$$d) \ \frac{2}{\left(S^2+4\right)^2}$$



5) 
$$L^{-1}\left\{\frac{S}{4S^2+9}\right\}$$
 is =

- a)  $\frac{1}{4}$ Cos $\left(\frac{3t}{2}\right)$  b)  $\frac{1}{4}$ Cos $\left(\frac{2t}{3}\right)$  c) Cos $\left(\frac{9t}{4}\right)$  d)  $\frac{1}{4}$ Cos $\left(\frac{9t}{4}\right)$
- 6)  $L^{-1}\left\{\frac{1}{(S-2)^2}\right\} =$
- b)  $\frac{e^{-2t}}{}$
- c) e<sup>2t</sup>

- 7) The solution of xp + yq = z is

- a)  $\phi(x, y) = 0$  b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$  c)  $\phi(xy, yz) = 0$  d)  $\phi(x^2, y^2) = 0$
- 8) Fourier expansion of  $f(x) = \begin{cases} -x, & -2 \le x \le 0 \\ x, & 0 \le x \le 2 \end{cases}$  in the interval (-2, 2) has
  - a) No cosine terms

- b) No sine terms
- c) Both cosine and sine terms
- d) None of these
- 9) If  $\bar{r} = xi + yj + zk$  and  $\bar{a} = \frac{r}{3}$  then div  $(\bar{a}) = \frac{r}{3}$

- d) 2

- 10) Which of the following is not true?
  - a)  $\nabla \phi$  is a vector quantity
- b)  $\nabla_{\cdot} \mathbf{v}$  is a scalar quantity
- c)  $\nabla \times \overline{\mathbf{y}}$  is a scalar quantity
- d)  $\nabla \cdot \nabla \phi = \nabla^2 \phi$
- 11) If  $\bar{r} = xi + yj + zk$ , then  $\nabla \times \bar{r} =$

- c) 0

- 12) If  $z\{f(k)\} = F(z)$ , then  $z\{a^k f(k)\} =$ 

  - a)  $F\left(\frac{a}{z}\right)$  b)  $\frac{1}{a}F\left(\frac{z}{a}\right)$  c)  $\frac{1}{a}F\left(\frac{a}{z}\right)$  d)  $F\left(\frac{z}{a}\right)$
- 13) The region of convergence of z-transform of the sequence  $f(k) = \begin{cases} 1, & k \ge 0 \\ 0, & k < 0 \end{cases}$  is
- b) |z| < 1

- 14) The Fourier sine transform F<sub>s</sub>(s) is given by
  - a)  $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \cdot \cos sx dx$

b)  $\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \sin sx dx$ 

c)  $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \sin sx \, dx$ 

d)  $\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \cos sx dx$ 



Seat No.

### S.E. (Part – I) (E&TC) (CGPA) Examination, 2016 **ENGINEERING MATHEMATICS - III**

Day and Date: Tuesday, 13-12-2016

Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

 Attempt any three questions from each Section.
 Figures to right indicate full marks.
 Use of calculator is allowed. Instructions:

SECTION - I

2. a) Solve  $(D^2 - 4D + 3)y = e^x \cos 2x$ .

3

b) Solve  $(D^3 - 2D + 4)y = 3x^2 - 5x + 2$ 

3

3

3

c) In an LCR circuit the charge q on a plate of condenser is given by

$$L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{c} = 0.$$

Solve the equation with initial conditions  $q = q_0$  and  $\frac{dq}{dt} = 0$  when t = 0 and  $CR^2 < 4L$ .

3. a) Evaluate the integral by using Laplace transform  $\int_{0}^{\infty} \frac{\cos 6t - \cos 4t}{t} dt$ . 3

b) Express the following functions in terms of Heaviside unit step function and hence find their Laplace transform.

$$f(t) = \begin{cases} cost, & 0 < t \leq \pi \\ 1, & \pi < t \leq 2\pi \\ sint, & t > 2\pi \end{cases}.$$

c) Find L $\{f(t)\}\$ , where  $f(t) = e^{-t}$ , 0 < t < 1 and f(t + 1) = f(t).

4. a) Find inverse Laplace transform of  $\cot^{-1}\left(\frac{s+a}{b}\right)$ . 3

b) Find 
$$L^{-1} \left\{ \frac{s^2 + 2s + 3}{\left(s^2 + 2s + 2\right)\left(s^2 + 2s + 5\right)} \right\}$$
.

c) Solve  $y'' + 6y' + 9y = 12t^2e^{-3t}$ , subject to the conditions, y(0) = 0, y'(0) = 0 by using Laplace transform method. 4

c) Find 
$$L^{-1}\left\{\frac{s}{(s+2)(s^2+4)}\right\}$$
 using convolution theorem.

Set P



5. a) Solve  $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ .

3

b) Solve  $z^2(p^2 + q^2) = x + y$ .

3

c) Solve  $z^2(p^2 + q^2 + 1) = k^2$ .

3

### SECTION - II

6. a) Find the tangential and normal components of acceleration of particle moving on the curve  $x = t^3 + 1$ ,  $y = t^2$ , z = t at t = 1.

4

b) Find the directional derivative of  $\phi = 2x^3y - 3y^2z$  at P(1, 2, -1) in the direction towards Q(3, -1, 5). In what direction from P is the directional derivative maximum? Find the magnitude of maximum directional derivative.

3

c) Show that  $\nabla \left( \overline{a} \cdot \nabla \frac{1}{r} \right) = \frac{-\overline{a}}{r^3} + \frac{3(\overline{a} \cdot \overline{r})\overline{r}}{r^5}$  where  $\overline{a}$  is a constant vector and r,  $\overline{r}$  have usual meaning

3

7. Attempt any three:

9

- a) Find z-transform of  $x_k = \left(\frac{1}{2}\right)^{|k|}$ , for all k.

b) Find 
$$z^{-1}\left\{\frac{z}{(z-2)(z-3)}\right\}$$
,  $|z| < 2$ .

c) Find 
$$z^{-1} \left\{ \frac{z^2}{\left(z - \frac{1}{4}\right)\left(z - \frac{1}{5}\right)} \right\}$$
,  $|z| < \frac{1}{5}$ .

d) Find  $z \{k2^k + k3^k\}, k \ge 0$ .

5

8. a) Find Fourier series of  $f(x) = x \sin x$  in  $(-\pi, \pi)$ . Hence deduce that  $\frac{\pi-2}{4} = \frac{1}{1\times 2} - \frac{1}{2\times 5} + \frac{1}{5\times 7} - \dots$ 

4

b) Obtain Fourier expansion for  $f(x) = 2x - x^2$  in (0, 3).

- OR b) Expand  $\pi x x^2$  as a sine series in  $(0, \pi)$ .

4

9. a) Find the Fourier transform of  $f(x) = e^{-a|x|}$ .

3

- b) Express the function  $f(x) = \begin{cases} \sin x, & 0 \le x \le \pi \\ 0, & x > \pi \end{cases}$  as Fourier sine integral and hence

c) Find f(x) if its Fourier cosine transform is  $e^{-s}$ .

evaluate  $\int_{-\infty}^{\infty} \frac{\sin \omega x \sin \pi \omega}{1 - \omega^2} d\omega$ .

3

3


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### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 14

- 1. Choose the correct answer:
  - 1) Fourier expansion of  $f(x) = \begin{cases} -x, & -2 \le x \le 0 \\ x, & 0 \le x \le 2 \end{cases}$  in the interval (-2, 2) has
    - a) No cosine terms

- b) No sine terms
- c) Both cosine and sine terms
- d) None of these
- 2) If  $\bar{r} = xi + yj + zk$  and  $\bar{a} = \frac{r}{3}$  then  $div(\bar{a}) =$

- c) -1
- d) 2

- 3) Which of the following is not true?
  - a)  $\nabla \phi$  is a vector quantity
- b)  $\nabla_{\cdot} \overset{-}{\mathbf{v}}$  is a scalar quantity
- c)  $\nabla \times \overline{\mathbf{v}}$  is a scalar quantity d)  $\nabla \cdot \nabla \phi = \nabla^2 \phi$
- 4) If  $\bar{r} = xi + yj + zk$ , then  $\nabla \times \bar{r} =$ 
  - a) 3
- c) 0
- d) -3

- 5) If  $z\{f(k)\} = F(z)$ , then  $z\{a^k f(k)\} =$ 

  - a)  $F\left(\frac{a}{z}\right)$  b)  $\frac{1}{a}F\left(\frac{z}{a}\right)$  c)  $\frac{1}{a}F\left(\frac{a}{z}\right)$  d)  $F\left(\frac{z}{a}\right)$
- 6) The region of convergence of z-transform of the sequence  $f(k) = \begin{cases} 1, & k \ge 0 \\ 0, & k < 0 \end{cases}$  is
  - a) |z| > 1
- b) |z| < 1 c) z < 1
- d) z = 0



7) The Fourier sine transform  $F_s(s)$  is given by

a) 
$$\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \cdot \cos sx \, dx$$

b) 
$$\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \sin sx dx$$

c) 
$$\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \sin sx \, dx$$

d) 
$$\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \cos sx dx$$

8) The P.I. of  $(D + 1)^3 = e^{-x}$  is a)  $x e^{-x}$  b)  $\frac{x^3}{3}e^{-x}$ 

b) 
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$$e^{x}\left(x^{2} + \frac{x^{3}}{3}\right)$$
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10) If f(t) is a periodic function of period T, then  $L\{f(t)\}$ 

a) 
$$\frac{1}{1-e^{-ST}} \int_{0}^{T} e^{-St} f(t) dt$$

b) 
$$\frac{1}{1-e^{ST}}\int_{0}^{T}e^{-St}f(t)dt$$

c) 
$$\frac{1}{1-e^{-ST}}\int_{0}^{\infty} e^{-St}f(t)dt$$

d) None of these

11) The Laplace transform of  $\int_{0}^{1} Sin2udu$  is

a) 
$$\frac{2}{S^2 + 4}$$
 b)  $\frac{2}{S^2}$ 

b) 
$$\frac{2}{s^2}$$

c) 
$$\frac{2}{S(S^2+4)}$$

c) 
$$\frac{2}{S(S^2+4)}$$
 d)  $\frac{2}{(S^2+4)^2}$ 

12)  $L^{-1}\left\{\frac{S}{4c^2+6}\right\}$  is =

a) 
$$\frac{1}{4}$$
Cos $\left(\frac{3t}{2}\right)$ 

b) 
$$\frac{1}{4}$$
Cos $\left(\frac{2t}{3}\right)$ 

c) 
$$Cos\left(\frac{9t}{4}\right)$$

a) 
$$\frac{1}{4}$$
Cos $\left(\frac{3t}{2}\right)$  b)  $\frac{1}{4}$ Cos $\left(\frac{2t}{3}\right)$  c) Cos $\left(\frac{9t}{4}\right)$  d)  $\frac{1}{4}$ Cos $\left(\frac{9t}{4}\right)$ 

13)  $L^{-1}\left\{\frac{1}{(9-2)^2}\right\} =$ 

b) 
$$\frac{e^{-2t}}{t}$$

14) The solution of xp + yq = z

a) 
$$\phi(x, y) = 0$$

b) 
$$\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$$

c) 
$$\phi(xy, yz) = 0$$

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SECTION - I

2. a) Solve 
$$(D^2 - 4D + 3)y = e^x \cos 2x$$
.

b) Solve 
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c) In an LCR circuit the charge q on a plate of condenser is given by

$$L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{c} = 0.$$

Solve the equation with initial conditions  $q = q_0$  and  $\frac{dq}{dt} = 0$  when t = 0 and  $CR^2 < 4L$ . 3

3. a) Evaluate the integral by using Laplace transform  $\int_{0}^{\infty} \frac{\cos 6t - \cos 4t}{t} dt$ . 3

b) Express the following functions in terms of Heaviside unit step function and hence find their Laplace transform.

$$f(t) = \begin{cases} \cos t, & 0 < t \le \pi \\ 1, & \pi < t \le 2\pi \\ \sin t, & t > 2\pi \end{cases}.$$

c) Find L $\{f(t)\}\$ , where  $f(t) = e^{-t}$ , 0 < t < 1 and f(t + 1) = f(t). 3

4. a) Find inverse Laplace transform of  $\cot^{-1}\left(\frac{s+a}{b}\right)$ . 3

b) Find 
$$L^{-1} \left\{ \frac{s^2 + 2s + 3}{\left(s^2 + 2s + 2\right)\left(s^2 + 2s + 5\right)} \right\}$$
.

c) Solve  $y'' + 6y' + 9y = 12t^2e^{-3t}$ , subject to the conditions, y(0) = 0, y'(0) = 0 by using Laplace transform method.

c) Find 
$$L^{-1}\left\{\frac{s}{(s+2)(s^2+4)}\right\}$$
 using convolution theorem.

Set Q

4



5. a) Solve  $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ .

b) Solve  $z^2(p^2 + q^2) = x + y$ .

3

3

c) Solve  $z^2(p^2 + q^2 + 1) = k^2$ .

3

### SECTION - II

6. a) Find the tangential and normal components of acceleration of particle moving on the curve  $x = t^3 + 1$ ,  $y = t^2$ , z = t at t = 1.

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b) Find the directional derivative of  $\phi = 2x^3y - 3y^2z$  at P(1, 2, -1) in the direction towards Q(3, -1, 5). In what direction from P is the directional derivative maximum? Find the magnitude of maximum directional derivative.

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c) Show that  $\nabla \left( \overline{a} \cdot \nabla \frac{1}{r} \right) = \frac{-\overline{a}}{r^3} + \frac{3(\overline{a} \cdot \overline{r})\overline{r}}{r^5}$  where  $\overline{a}$  is a constant vector and r,  $\overline{r}$  have usual meaning

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7. Attempt any three:

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a) Find z-transform of  $x_k = \left(\frac{1}{2}\right)^{|k|}$ , for all k.

b) Find  $z^{-1} \left\{ \frac{z}{(z-2)(z-3)} \right\}$ , |z| < 2.

c) Find 
$$z^{-1} \left\{ \frac{z^2}{\left(z - \frac{1}{4}\right)\left(z - \frac{1}{5}\right)} \right\}$$
,  $|z| < \frac{1}{5}$ .

d) Find  $z \{k2^k + k3^k\}, k \ge 0$ .

8. a) Find Fourier series of  $f(x) = x \sin x$  in  $(-\pi, \pi)$ . Hence deduce that

$$\frac{\pi - 2}{4} = \frac{1}{1 \times 3} - \frac{1}{3 \times 5} + \frac{1}{5 \times 7} - \dots$$

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b) Obtain Fourier expansion for  $f(x) = 2x - x^2$  in (0, 3).

4

OR b) Expand  $\pi x - x^2$  as a sine series in  $(0, \pi)$ .

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9. a) Find the Fourier transform of  $f(x) = e^{-a|x|}$ .

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b) Express the function  $f(x) = \begin{cases} \sin x, & 0 \le x \le \pi \\ 0, & x > \pi \end{cases}$  as Fourier sine integral and hence

3

evaluate 
$$\int_{0}^{\infty} \frac{\sin \omega x \sin \pi \omega}{1 - \omega^{2}} d\omega.$$

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c) Find f(x) if its Fourier cosine transform is  $e^{-s}$ .

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### MCQ/Objective Type Questions

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1. Choose the correct answer:

1) 
$$L^{-1} \left\{ \frac{S}{4S^2 + 9} \right\}$$
 is =

a)  $\frac{1}{4} Cos \left( \frac{3t}{2} \right)$  b)  $\frac{1}{4} Cos \left( \frac{2t}{3} \right)$  c)  $Cos \left( \frac{9t}{4} \right)$ 

2)  $L^{-1} \left\{ \frac{1}{4} Cos \left( \frac{3t}{2} \right) \right\} = 0$ 

2) 
$$L^{-1}\left\{\frac{1}{(S-2)^2}\right\} =$$

a) 
$$e^{-2t}t$$
 b)  $\frac{e^{-2t}}{2}$ 

b) 
$$\frac{e^{-2t}}{t}$$
 c)  $e^{2t}$ 

3) The solution of xp + yq = z is

a) 
$$\phi(x, y) = 0$$
 b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$  c)  $\phi(xy, yz) = 0$  d)  $\phi(x^2, y^2) = 0$ 

- 4) Fourier expansion of  $f(x) = \begin{cases} -x, & -2 \le x \le 0 \\ x, & 0 \le x \le 2 \end{cases}$  in the interval (-2, 2) has
  - a) No cosine terms

- b) No sine terms
- c) Both cosine and sine terms
- d) None of these

5) If 
$$\bar{r} = xi + yj + zk$$
 and  $\bar{a} = \frac{r}{3}$  then div  $(\bar{a}) =$ 

- a) 0

- d) 2



- 6) Which of the following is not true?
  - a)  $\nabla \phi$  is a vector quantity
- b)  $\nabla_{\mathbf{v}}$  is a scalar quantity
- c)  $\nabla \times \overline{\mathbf{v}}$  is a scalar quantity
- d)  $\nabla \cdot \nabla \phi = \nabla^2 \phi$
- 7) If  $\bar{r} = xi + yj + zk$ , then  $\nabla \times \bar{r} =$

- c) 0

- 8) If  $z\{f(k)\} = F(z)$ , then  $z\{a^k f(k)\} =$ 

  - a)  $F\left(\frac{a}{z}\right)$  b)  $\frac{1}{a}F\left(\frac{z}{a}\right)$  c)  $\frac{1}{a}F\left(\frac{a}{z}\right)$  d)  $F\left(\frac{z}{a}\right)$
- 9) The region of convergence of z-transform of the sequence  $f(k) = \begin{cases} 1, & k \ge 0 \\ 0, & k < 0 \end{cases}$  is
- b) |z| < 1
- c) z < 1
- d) z = 0

- 10) The Fourier sine transform  $F_s(s)$  is given by
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- 12)  $\frac{1}{D^2} x^3$  is equal to
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- d)  $e^{-x} x^3$
- 13) If f(t) is a periodic function of period T, then  $L\{f(t)\}$ 
  - a)  $\frac{1}{1 e^{-ST}} \int_{0}^{1} e^{-St} f(t) dt$

b)  $\frac{1}{1-c}$   $\int_{0}^{1} e^{-st} f(t) dt$ 

c)  $\frac{1}{1 - e^{-ST}} \int_{0}^{\infty} e^{-St} f(t) dt$ 

- d) None of these
- 14) The Laplace transform of  $\int_{0}^{\iota} \sin 2u du$  is
  - a)  $\frac{2}{S^2 + 4}$  b)  $\frac{2}{S^2}$
- c)  $\frac{2}{S(S^2+4)}$  d)  $\frac{2}{(S^2+4)^2}$



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c) Find L $\{f(t)\}\$ , where  $f(t) = e^{-t}$ , 0 < t < 1 and f(t + 1) = f(t).

3

4. a) Find inverse Laplace transform of  $\cot^{-1}\left(\frac{s+a}{b}\right)$ .

3

b) Find 
$$L^{-1} \left\{ \frac{s^2 + 2s + 3}{\left(s^2 + 2s + 2\right)\left(s^2 + 2s + 5\right)} \right\}$$
.

c) Solve  $y'' + 6y' + 9y = 12t^2e^{-3t}$ , subject to the conditions, y(0) = 0, y'(0) = 0 by using Laplace transform method.

4

c) Find 
$$L^{-1}\left\{\frac{s}{(s+2)(s^2+4)}\right\}$$
 using convolution theorem.

Set R



5. a) Solve  $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ .

3

b) Solve  $z^2(p^2 + q^2) = x + y$ .

3

c) Solve  $z^2(p^2 + q^2 + 1) = k^2$ .

3

### SECTION - II

6. a) Find the tangential and normal components of acceleration of particle moving on the curve  $x = t^3 + 1$ ,  $y = t^2$ , z = t at t = 1.

4

b) Find the directional derivative of  $\phi = 2x^3y - 3y^2z$  at P(1, 2, -1) in the direction towards Q(3, -1, 5). In what direction from P is the directional derivative maximum? Find the magnitude of maximum directional derivative.

3

c) Show that  $\nabla \left( \overline{a} \cdot \nabla \frac{1}{r} \right) = \frac{-\overline{a}}{r^3} + \frac{3(\overline{a} \cdot \overline{r})\overline{r}}{r^5}$  where  $\overline{a}$  is a constant vector and r,  $\overline{r}$  have usual meaning

3

7. Attempt any three:

9

- a) Find z-transform of  $x_k = \left(\frac{1}{2}\right)^{|k|}$ , for all k.

b) Find  $z^{-1} \left\{ \frac{z}{(z-2)(z-3)} \right\}$ , |z| < 2.

c) Find  $z^{-1} \left\{ \frac{z^2}{\left(z - \frac{1}{4}\right)\left(z - \frac{1}{5}\right)} \right\}, |z| < \frac{1}{5}.$ 

- d) Find  $z \{k2^k + k3^k\}, k \ge 0$ .
- 8. a) Find Fourier series of  $f(x) = x \sin x$  in  $(-\pi, \pi)$ . Hence deduce that

5

 $\frac{\pi-2}{4} = \frac{1}{1\times 2} - \frac{1}{2\times 5} + \frac{1}{5\times 7} - \dots$ 

evaluate  $\int_{-\infty}^{\infty} \frac{\sin \omega x \sin \pi \omega}{1 - \omega^2} d\omega$ .

4

b) Obtain Fourier expansion for  $f(x) = 2x - x^2$  in (0, 3).

4

OR b) Expand  $\pi x - x^2$  as a sine series in  $(0, \pi)$ .

3

9. a) Find the Fourier transform of  $f(x) = e^{-a|x|}$ .

b) Express the function  $f(x) = \begin{cases} \sin x, & 0 \le x \le \pi \\ 0, & x > \pi \end{cases}$  as Fourier sine integral and hence

3

c) Find f(x) if its Fourier cosine transform is  $e^{-s}$ .

3

Seat No.

# S.E. (Part – I) (E&TC) (CGPA) Examination, 2016 **ENGINEERING MATHEMATICS - III**

Day and Date: Tuesday, 13-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

1) Attempt any three questions from each Section. Instructions:

- 2) Figures to right indicate full marks.
- 3) Use of calculator is allowed.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 14

- Choose the correct answer :
  - 1) Which of the following is not true?
    - a)  $\nabla \phi$  is a vector quantity
- b)  $\nabla_{\mathbf{v}}$  is a scalar quantity
- c)  $\nabla \times \overline{\mathbf{v}}$  is a scalar quantity
- d)  $\nabla \cdot \nabla \phi = \nabla^2 \phi$
- 2) If  $\bar{r} = xi + yj + zk$ , then  $\nabla \times \bar{r} =$ 
  - a) 3
- c) 0

- 3) If  $z\{f(k)\} = F(z)$ , then  $z\{a^kf(k)\} =$ 

  - a)  $F\left(\frac{a}{z}\right)$  b)  $\frac{1}{a}F\left(\frac{z}{a}\right)$  c)  $\frac{1}{a}F\left(\frac{a}{z}\right)$  d)  $F\left(\frac{z}{a}\right)$
- 4) The region of convergence of z-transform of the sequence  $f(k) = \begin{cases} 1, & k \ge 0 \\ 0, & k < 0 \end{cases}$  is
- b) |z| < 1
- c) z < 1
- d) z = 0

- 5) The Fourier sine transform  $F_s(s)$  is given by
  - a)  $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \cdot \cos sx \, dx$

b)  $\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \sin sx dx$ 

c)  $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \sin sx dx$ 

- d)  $\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \cos sx dx$
- 6) The P.I. of  $(D + 1)^3 = e^{-x}$  is a)  $x e^{-x}$  b)  $\frac{x^3}{3} e^{-x}$
- c)  $\frac{x^2}{2}e^{-x}$



# 7) $\frac{1}{D^2}x^3$ is equal to

- b)  $e^{x}\left(x^{2} + \frac{x^{3}}{3}\right)$  c)  $\frac{x^{5}}{20}$
- d)  $e^{-x} x^3$
- 8) If f(t) is a periodic function of period T, then L{f(t)} =
  - a)  $\frac{1}{1 e^{-ST}} \int_{0}^{1} e^{-St} f(t) dt$

b)  $\frac{1}{1 - ST} \int_{0}^{1} e^{-St} f(t) dt$ 

c)  $\frac{1}{1-ST}\int_{0}^{\infty} e^{-St}f(t)dt$ 

- d) None of these
- 9) The Laplace transform of  $\int_{0}^{t} \sin 2u du$  is
  - a)  $\frac{2}{8^{2}+4}$
- b)  $\frac{2}{s^2}$
- c)  $\frac{2}{S(S^2+4)}$  d)  $\frac{2}{(S^2+4)^2}$

- 10)  $L^{-1}\left\{\frac{S}{40^2+9}\right\}$  is =

- a)  $\frac{1}{4} \cos\left(\frac{3t}{2}\right)$  b)  $\frac{1}{4} \cos\left(\frac{2t}{3}\right)$  c)  $\cos\left(\frac{9t}{4}\right)$  d)  $\frac{1}{4} \cos\left(\frac{9t}{4}\right)$
- 11)  $L^{-1}\left\{\frac{1}{(S-2)^2}\right\} =$ 
  - a)  $e^{-2t}t$
- b)  $\frac{e^{-2t}}{1}$
- c) e<sup>2t</sup>
- d) te<sup>2t</sup>

- 12) The solution of xp + yq = z is

- a)  $\phi(x, y) = 0$  b)  $\phi\left(\frac{x}{y}, \frac{y}{z}\right) = 0$  c)  $\phi(xy, yz) = 0$  d)  $\phi(x^2, y^2) = 0$
- 13) Fourier expansion of  $f(x) = \begin{cases} -x, & -2 \le x \le 0 \\ x, & 0 \le x \le 2 \end{cases}$  in the interval (-2, 2) has
  - a) No cosine terms

- b) No sine terms
- c) Both cosine and sine terms
- d) None of these
- 14) If  $\bar{r} = xi + yj + zk$  and  $\bar{a} = \frac{r}{3}$  then div $(\bar{a}) = \frac{r}{3}$ 
  - a) 0
- b) 1
- c) -1
- d) 2

Seat No.

### S.E. (Part – I) (E&TC) (CGPA) Examination, 2016 **ENGINEERING MATHEMATICS - III**

Day and Date: Tuesday, 13-12-2016

Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

 Attempt any three questions from each Section.
 Figures to right indicate full marks.
 Use of calculator is allowed. Instructions:

SECTION - I

2. a) Solve  $(D^2 - 4D + 3)y = e^x \cos 2x$ .

3

b) Solve  $(D^3 - 2D + 4)y = 3x^2 - 5x + 2$ 

3

c) In an LCR circuit the charge q on a plate of condenser is given by

$$L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{c} = 0.$$

Solve the equation with initial conditions  $q = q_0$  and  $\frac{dq}{dt} = 0$  when t = 0 and  $CR^2 < 4L$ .

3

3. a) Evaluate the integral by using Laplace transform  $\int_{0}^{\infty} \frac{\cos 6t - \cos 4t}{t} dt$ .

3

b) Express the following functions in terms of Heaviside unit step function and hence find their Laplace transform.

$$f(t) = \begin{cases} \cos t, & 0 < t \leq \pi \\ 1, & \pi < t \leq 2\pi \\ \text{sint}, & t > 2\pi \end{cases}.$$

c) Find L $\{f(t)\}\$ , where  $f(t) = e^{-t}$ , 0 < t < 1 and f(t + 1) = f(t).

3

3

4. a) Find inverse Laplace transform of  $\cot^{-1}\left(\frac{s+a}{b}\right)$ .

3

b) Find  $L^{-1} \left\{ \frac{s^2 + 2s + 3}{\left(s^2 + 2s + 2\right)\left(s^2 + 2s + 5\right)} \right\}$ .

3

c) Solve  $y'' + 6y' + 9y = 12t^2e^{-3t}$ , subject to the conditions, y(0) = 0, y'(0) = 0 by using Laplace transform method.

4

c) Find  $L^{-1} \left\{ \frac{s}{(s+2)(s^2+4)} \right\}$  using convolution theorem. 4

Set S



5. a) Solve  $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ .

3

b) Solve  $z^2(p^2 + q^2) = x + y$ .

3

c) Solve  $z^2(p^2 + q^2 + 1) = k^2$ .

3

### SECTION - II

6. a) Find the tangential and normal components of acceleration of particle moving on the curve  $x = t^3 + 1$ ,  $y = t^2$ , z = t at t = 1.

4

b) Find the directional derivative of  $\phi = 2x^3y - 3y^2z$  at P(1, 2, -1) in the direction towards Q(3, -1, 5). In what direction from P is the directional derivative maximum? Find the magnitude of maximum directional derivative.

3

c) Show that  $\nabla \left( \overline{a} \cdot \nabla \frac{1}{r} \right) = \frac{-\overline{a}}{r^3} + \frac{3(\overline{a} \cdot \overline{r})\overline{r}}{r^5}$  where  $\overline{a}$  is a constant vector and r,  $\overline{r}$  have usual meaning

3

7. Attempt any three:

9

- a) Find z-transform of  $x_k = \left(\frac{1}{2}\right)^{|k|}$ , for all k.
- b) Find  $z^{-1} \left\{ \frac{z}{(z-2)(z-3)} \right\}$ , |z| < 2.
- c) Find  $z^{-1} \left\{ \frac{z^2}{\left(z \frac{1}{4}\right)\left(z \frac{1}{5}\right)} \right\}, |z| < \frac{1}{5}.$
- d) Find  $z \{k2^k + k3^k\}, k \ge 0$ .

5

8. a) Find Fourier series of  $f(x) = x \sin x$  in  $(-\pi, \pi)$ . Hence deduce that  $\frac{\pi-2}{4} = \frac{1}{1\times 2} - \frac{1}{2\times 5} + \frac{1}{5\times 7} - \dots$ 

4

b) Obtain Fourier expansion for  $f(x) = 2x - x^2$  in (0, 3).

4

OR b) Expand  $\pi x - x^2$  as a sine series in  $(0, \pi)$ .

3

9. a) Find the Fourier transform of  $f(x) = e^{-a|x|}$ .

b) Express the function  $f(x) = \begin{cases} \sin x, & 0 \le x \le \pi \\ 0, & x > \pi \end{cases}$  as Fourier sine integral and hence

3

evaluate  $\int_{-\infty}^{\infty} \frac{\sin \omega x \sin \pi \omega}{1 - \omega^2} d\omega$ .

c) Find f(x) if its Fourier cosine transform is  $e^{-s}$ .

3


Seat	
No.	

Set P

S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 **ELECTRONIC CIRCUIT ANALYSIS AND DESIGN - I** Day and Date: Thursday, 15-12-2016 Max. Marks: 70 Time: 10.00 a.m. to 1.00 p.m. Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each guestion carries one mark. 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 14 1. Choose the correct answer: 14 1) Improper location of Q point leads to \_\_\_\_\_ of transistor amplifier. a) Distortion in input b) Distortion in output c) Heavy loading d) None of these 2) The h-parameter of BJT are called a) Large signal parameters b) Small signal parameters c) T-parameters d) z-parameters 3) Low frequency response of BJT amplifier depends on a) Input resistance b) Output resistance c) Both i/p and o/p resistance d) None of these 4) JFET can be used as an \_\_\_\_\_ ohmic region. a) Oscillator b) Clock generator c) Flip-flop d) Resistor 5) Power dissipated in transistor amplifier depends on a) Vcc b) Re c) Vce and lc d) None



6)	In voltage regulator a) Vin	rusing zener, the o b) Vz	_	ut voltage depe RL		on All of these
7)	Common base con a) Unity current ga c) Both (a) and (b)	in	b)	des Unity voltage ga None of these	ain	
8)	In any circuit Zenera) Acts as regulated b) Acting as regulated c) A very fast photed d) Introduce a dc v	or after reverse bre ator in forward bias o diode			ed n	ninority carriers
9)	Ripple voltage increasing load correr	dcurrent	b)	tor filter with Increasing load None of these	l cui	rrent
10)	Increase in load cu a) Decrease ripple c) Does not chang		b)	or filter Increase ripple None of these		
11)	Load current in half a) Both half-cycles c) Less than half c	s of input	b)	ter capacitor flo One half-cycle None of these	ws	for
12)	The ripple frequence a) Double the input free	t frequency	b)	ier is Equal to the inp None of these	out f	requency
13)	The forward resista a) Infinity	ance of an ideal red b) Negative		er diode should l Zero		None of these
14)	The reverse satura a) Increases c) Remains consta		b)	asing reverse b Decreases Zero	ias	



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# S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – I

Day and Date: Thursday, 15-12-2016 Marks: 56

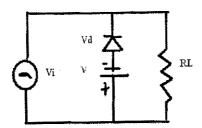
Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four: (3.5×4=14)

a) Explain ratings for PN junction diode in detail.

- b) Explain with diagram voltage trippler.
- c) Derive expression for ripple factor of LC filter.
- d) Derive expression for zener regulator for variable input voltage and fixed load resistance.
- e) Explain the operation of the circuit shown below. Draw input and output waveforms and transfer characteristics. Assume Vi = 6 sinwt, Vi = 0, Vi = 3.



### 3. Attempt any two:

 $(7 \times 2 = 14)$ 

- a) Explain types of shunt clipper circuits and shunt clampers with transfer characteristics.
- b) Draw circuit diagram of full wave rectifier with C filter and explain it's working. Derive expression of ripple factor of C filter.
- c) Design voltage source using full wave bridge rectifier with inductor filter for ripple factor of 10% and Vdc of 11 V and Idc of 100 mA. Line frequency is 50 Hz.



### SECTION - II

4. Solve any four: (3.5×4=14)

- a) Compare BJT transistor and FET with respect to different parameters.
- b) Derive equation for stability factor for voltage divider bias circuit.
- c) Explain stability in transistor amplifier and compare amplifier with different biasing.
- d) Explain types of MOSFET with output transfer characteristics.
- e) Define significance of hybrid parameters in amplifier analysis.

5. Solve any two: (7×2=14)

- a) Explain frequency response of transistor amplifier. Derive expression for lower and higher cutoff frequencies.
- b) Explain following terms:
  - 1) Early effect
  - 2) Thermal runway
  - 3) Relation between  $\alpha$  and  $\beta$ .
- c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

Set P

Seat	
No.	

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# S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – I

Day and Date: Thursday, 15-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

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

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

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

14

- 1) In any circuit Zener diode is
  - a) Acts as regulator after reverse breakdown
  - b) Acting as regulator in forward bias
  - c) A very fast photo diode
  - d) Introduce a dc voltage depends on thermally generated minority carriers
- 2) Ripple voltage increases in shunt capacitor filter with
  - a) Decreasing load current
- b) Increasing load current

c) Zero load current

- d) None of these
- 3) Increase in load current for series inductor filter
  - a) Decrease ripple

- b) Increase ripple
- c) Does not change the ripple
- d) None of these
- 4) Load current in half-wave rectifier with filter capacitor flows for
  - a) Both half-cycles of input
- b) One half-cycle
- c) Less than half cycle
- d) None of these



5)	The ripple frequence a) Double the input c) Half the input fre	frequency	b)	Equal to the inp	ut f	requency
6)	The forward resista a) Infinity	nce of an ideal red b) Negative				None of these
7)	The reverse satura a) Increases c) Remains consta		b)	easing reverse bi Decreases Zero	ias	
8)	Improper location of a) Distortion in inputo) Heavy loading		b)	of trans Distortion in ou None of these		-
9)	The h-parameter of a) Large signal par c) T-parameters		•	Small signal pa z-parameters	ran	neters
10)	Low frequency resp a) Input resistance c) Both i/p and o/p	·	b)	r depends on Output resistan None of these	се	
11)	JFET can be used a a) Oscillator c) Flip-flop	as an c	b)	nic region. Clock generato Resistor	r	
	Power dissipated in a) Vcc				d)	None
13)	In voltage regulator a) Vin	using zener, the c	_	out voltage depe		on All of these
14)	Common base confa) Unity current ga c) Both (a) and (b)	-	b)	ides Unity voltage ga None of these	ain	



Seat	
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# S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – I

Day and Date: Thursday, 15-12-2016 Marks: 56

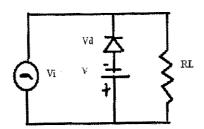
Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four: (3.5×4=14)

a) Explain ratings for PN junction diode in detail.

- b) Explain with diagram voltage trippler.
- c) Derive expression for ripple factor of LC filter.
- d) Derive expression for zener regulator for variable input voltage and fixed load resistance.
- e) Explain the operation of the circuit shown below. Draw input and output waveforms and transfer characteristics. Assume Vi = 6 sinwt, Vi = 0, Vi = 3.



### 3. Attempt any two:

 $(7 \times 2 = 14)$ 

- a) Explain types of shunt clipper circuits and shunt clampers with transfer characteristics.
- b) Draw circuit diagram of full wave rectifier with C filter and explain it's working. Derive expression of ripple factor of C filter.
- c) Design voltage source using full wave bridge rectifier with inductor filter for ripple factor of 10% and Vdc of 11 V and Idc of 100 mA. Line frequency is 50 Hz.

# 

### SECTION - II

4. Solve any four: (3.5×4=14)

- a) Compare BJT transistor and FET with respect to different parameters.
- b) Derive equation for stability factor for voltage divider bias circuit.
- c) Explain stability in transistor amplifier and compare amplifier with different biasing.
- d) Explain types of MOSFET with output transfer characteristics.
- e) Define significance of hybrid parameters in amplifier analysis.

5. Solve any two: (7×2=14)

- a) Explain frequency response of transistor amplifier. Derive expression for lower and higher cutoff frequencies.
- b) Explain following terms:
  - 1) Early effect
  - 2) Thermal runway
  - 3) Relation between  $\alpha$  and  $\beta$ .
- c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

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c) Zero load current

# **SLR-EP - 126**

Seat	Set	R
No.		- 1

•	, ,	I) (CGPA) Examina ANALYSIS AND D	
Day and Date : Thurso Time : 10.00 a.m. to 1			Max. Marks : 70
Instructions :	30 minutes in carries one ma 2) Answer MCQ/	Objective type questic	
Duration : 30 Minutes	MCQ/Object	ive Type Questions	Marks : 14
Choose the corre	ct answer :		14
1) Power dissipa a) Vcc	nted in transistor ar b) Re	nplifier depends on c) Vce and Ic	d) None
<ol><li>In voltage reg</li><li>Vin</li></ol>	ulator using zener, b) Vz	the output voltage dep	ends on d) All of these
<ul><li>3) Common base</li><li>a) Unity curre</li><li>c) Both (a) ar</li></ul>	•	BJT provides b) Unity voltage d) None of these	~
b) Acting as r c) A very fast	gulator after revers regulator in forward photo diode		ated minority carriers
	g load current	nt capacitor filter with b) Increasing load	

d) None of these



6)	Increase in load current for series inc	duct	or filter
	a) Decrease ripple	b)	Increase ripple
	c) Does not change the ripple	d)	None of these
7)	Load current in half-wave rectifier wit		-
	a) Both half-cycles of input	b)	One half-cycle
	c) Less than half cycle	d)	None of these
8)	The ripple frequency in a full-wave re	ectif	ier is
	a) Double the input frequency	b)	Equal to the input frequency
	c) Half the input frequency	d)	None of these
9)	The forward resistance of an ideal red	ctifie	er diode should be
·	a) Infinity b) Negative	c)	Zero d) None of these
10)	The reverse saturation current with in	ncre	asing reverse bias
,	a) Increases		Decreases
	c) Remains constant	,	Zero
11)	Improper location of Q point leads to		of transistor amplifier.
,	a) Distortion in input		Distortion in output
	c) Heavy loading		None of these
40\	-	,	
12)	The h-parameter of BJT are called a) Large signal parameters	h)	Small signal parameters
	c) T-parameters	-	z-parameters
	, ·	-	•
•	Low frequency response of BJT ampl		•
	a) Input resistance	b)	Output resistance
	c) Both i/p and o/p resistance	d)	None of these
14)	JFET can be used as an c	ohm	nic region.
	a) Oscillator	b)	Clock generator
	c) Flip-flop	d)	Resistor



Seat	
No.	

# S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – I

Day and Date: Thursday, 15-12-2016 Marks: 56

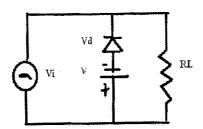
Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four: (3.5×4=14)

a) Explain ratings for PN junction diode in detail.

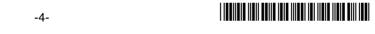
- b) Explain with diagram voltage trippler.
- c) Derive expression for ripple factor of LC filter.
- d) Derive expression for zener regulator for variable input voltage and fixed load resistance.
- e) Explain the operation of the circuit shown below. Draw input and output waveforms and transfer characteristics. Assume Vi = 6 sinwt, Vi = 0, Vi = 3.



# 3. Attempt any two:

 $(7 \times 2 = 14)$ 

- a) Explain types of shunt clipper circuits and shunt clampers with transfer characteristics.
- b) Draw circuit diagram of full wave rectifier with C filter and explain it's working. Derive expression of ripple factor of C filter.
- c) Design voltage source using full wave bridge rectifier with inductor filter for ripple factor of 10% and Vdc of 11 V and Idc of 100 mA. Line frequency is 50 Hz.



### SECTION - II

4. Solve any four: (3.5×4=14)

- a) Compare BJT transistor and FET with respect to different parameters.
- b) Derive equation for stability factor for voltage divider bias circuit.
- c) Explain stability in transistor amplifier and compare amplifier with different biasing.
- d) Explain types of MOSFET with output transfer characteristics.
- e) Define significance of hybrid parameters in amplifier analysis.

5. Solve any two: (7×2=14)

- a) Explain frequency response of transistor amplifier. Derive expression for lower and higher cutoff frequencies.
- b) Explain following terms:
  - 1) Early effect
  - 2) Thermal runway
  - 3) Relation between  $\alpha$  and  $\beta$ .
- c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

Set R

c) Remains constant

# **SLR-EP - 126**

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S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 **ELECTRONIC CIRCUIT ANALYSIS AND DESIGN - I** Day and Date: Thursday, 15-12-2016 Max. Marks: 70 Time: 10.00 a.m. to 1.00 p.m. Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each guestion carries one mark. 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page. MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 14 1. Choose the correct answer: 14 1) Increase in load current for series inductor filter a) Decrease ripple b) Increase ripple d) None of these c) Does not change the ripple 2) Load current in half-wave rectifier with filter capacitor flows for a) Both half-cycles of input b) One half-cycle c) Less than half cycle d) None of these 3) The ripple frequency in a full-wave rectifier is a) Double the input frequency b) Equal to the input frequency c) Half the input frequency d) None of these 4) The forward resistance of an ideal rectifier diode should be a) Infinity b) Negative c) Zero d) None of these 5) The reverse saturation current with increasing reverse bias a) Increases b) Decreases

d) Zero



6)	i) Improper location of Q point leads to		of transistor amplifier.			
	a) Distortion in inpu	ut	b)	Distortion in our	tput	
	c) Heavy loading		d)	None of these		
7)	The h-parameter of					
	a) Large signal par	ameters		Small signal pa	rame	eters
	c) T-parameters		d)	z-parameters		
8)	Low frequency resp	onse of BJT ampl	ifiei	depends on		
	a) Input resistance		b)	Output resistan	ce	
	c) Both i/p and o/p	resistance	d)	None of these		
9)	JFET can be used a	as an c	hm	nic region		
Ο,	a) Oscillator	20 an		Clock generato	r	
	c) Flip-flop			Resistor	•	
			•			
10)	Power dissipated in	·		-		
	a) Vcc	b) Re	c)	Vce and Ic	d) I	None
11)	In voltage regulator	using zener, the o	utp	ut voltage depe	nds	on
	a) Vin	b) Vz	c)	RL	d) /	All of these
12)	Common base conf	figuration in BJT pr	rovi	des		
,	a) Unity current ga	•		Unity voltage ga	ain	
	c) Both (a) and (b)		-	None of these		
			,			
13)	In any circuit Zener					
	a) Acts as regulato			down		
	b) Acting as regula		i			
	c) A very fast photo		. عالم .	- w II. /	مدر ام م	
	d) Introduce a dc v	onage depends or	ı tric	ermally generate	∌a m	inonly carriers
14)	Ripple voltage incre	eases in shunt cap	aci	tor filter with		
	a) Decreasing load	l current	b)	Increasing load	curr	rent
	c) Zero load currer	nt	d)	None of these		



Seat	
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# S.E. (E and TC) (Part – I) (CGPA) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS AND DESIGN – I

Day and Date: Thursday, 15-12-2016 Marks: 56

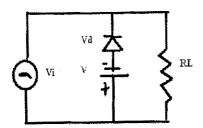
Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four: (3.5×4=14)

a) Explain ratings for PN junction diode in detail.

- b) Explain with diagram voltage trippler.
- c) Derive expression for ripple factor of LC filter.
- d) Derive expression for zener regulator for variable input voltage and fixed load resistance.
- e) Explain the operation of the circuit shown below. Draw input and output waveforms and transfer characteristics. Assume Vi = 6 sinwt, Vi = 0, Vi = 3.



# 3. Attempt any two:

 $(7 \times 2 = 14)$ 

- a) Explain types of shunt clipper circuits and shunt clampers with transfer characteristics.
- b) Draw circuit diagram of full wave rectifier with C filter and explain it's working. Derive expression of ripple factor of C filter.
- c) Design voltage source using full wave bridge rectifier with inductor filter for ripple factor of 10% and Vdc of 11 V and Idc of 100 mA. Line frequency is 50 Hz.

# 

### SECTION - II

4. Solve any four: (3.5×4=14)

- a) Compare BJT transistor and FET with respect to different parameters.
- b) Derive equation for stability factor for voltage divider bias circuit.
- c) Explain stability in transistor amplifier and compare amplifier with different biasing.
- d) Explain types of MOSFET with output transfer characteristics.
- e) Define significance of hybrid parameters in amplifier analysis.

5. Solve any two: (7×2=14)

- a) Explain frequency response of transistor amplifier. Derive expression for lower and higher cutoff frequencies.
- b) Explain following terms:
  - 1) Early effect
  - 2) Thermal runway
  - 3) Relation between  $\alpha$  and  $\beta$ .
- c) Derive expression Avs, Ais, Ri, Ro for transistor amplifier using voltage divider bias with emitter bypass capacitor.

Set S

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No.	

Set P

 $(1 \times 14 = 14)$ 

# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date : Saturday, 17-12-2016	Total Marks : 70
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Time: 10.00 a.m. to 1.00 p.m.

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

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

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

Duration: 30 Minutes Marks: 14

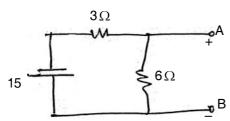
1) A Network has 7 nodes and 5 independent loops the number of branches in the networks is

a) 10

1. Choose the correct answer:

- h) 11
- c) 12
- d) 13

2) The current source transformation of following circuit between AB will be parallel combination of



- a) 5A, 3  $\Omega$
- b) 5A, 2  $\Omega$
- c) -5A,  $6\Omega$
- d) -5A, 2  $\Omega$

3) Superposition theorem is not valid for

a) Current responses

b) Voltage responses

c) Power responses

d) Both a & b

4) In a series resonant circuit, Vc = 100V, VL = 100V and VR = 75V, what is the value of source voltage?

- a) 100 V
- b) 150 V
- c) 0 V
- d) 75 V

5) For a given value of Q and Resonant frequency fr, bandwidth is given by

a) fr/Q

b)  $Fr \times Q$ 

c) Q/fr

d) None of the above

6) Which parameters are widely used in transmission line theory?

a) Z

- b) Y
- c) h
- d) ABCD

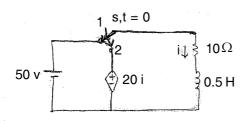
7) For a two port bilateral network, the three transmission line parameters are given by A = 6/5, B = 17/5 and C = 1/5, what is the value of D?

a) 1

- b) 7/5
- c) 1/5
- d) 5/7



- 8) The transfer impedance is defined as
  - a) The ratio of transform voltage to transform current at the same port
  - b) The ratio of transform voltage at one port to transform current at the other port
  - c) Both a & b
  - d) None of the above
- 9) The necessary condition for driving point function is
  - a) The real part of all poles and zero must not be negative
  - b) The polynomials P(s) and Q (s) may not have any missing terms between the highest and lowest degree unless all even or all odds terms are missing
  - c) The degree of P(s) and Q (s) may differ by more than one
  - d) The lowest degree of P(s) and Q (s) may differ in degree by more than two
- 10) When a series RL circuit is connected to voltage source v at t = 0, the current passing through the inductor L at t = 0 is
  - a)  $\frac{V}{R}$
- b) infinite
- c) zero
- d)  $\frac{V}{L}$
- 11) For the circuit shown current in the 10  $\Omega$  resistance when the switch is changed from 1 to 2 is



- a) 5e<sup>20t</sup>
- b) 5e<sup>-20t</sup>
- c) 20e<sup>5t</sup>
- d) 20e<sup>-5t</sup>
- 12) The transient current in loss free LC circuit when excited from AC source is an \_\_\_\_\_ sine wave.
  - a) un damped

b) over damped

c) under damped

- d) critically damped
- 13) The propagation constant of symmetrical T-network is
  - a)  $Cos(Y)=1+Z_1/2Z_2$

b)  $Cosh(Y) = 1+Z_1/2Z_2$ 

c)  $Cosh(Y) = 1+Z_1/4Z_2$ 

- d)  $Cosh(Y)=1+Z_1/Z_2$
- 14) In the M-derived low pass filter the resonant frequency is to be choosen so that it is
  - a) Above cut-off frequency

- b) Below cut-off frequency
- c) Equal to cut-off frequency
- d) None of the above



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# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date: Saturday, 17-12-2016 Marks:56

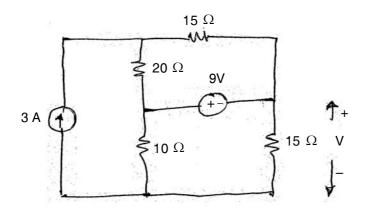
Time: 10.00 a.m. to 1.00 p.m.

SECTION - I

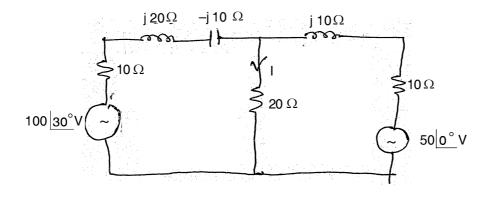
2. Answer any four of the following.

 $(4 \times 4 = 16)$ 

1) Using superposition principle, determine the value of V in the circuit shown below

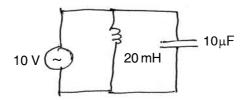


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

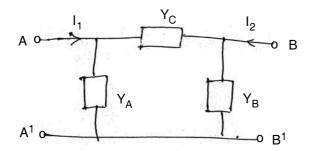




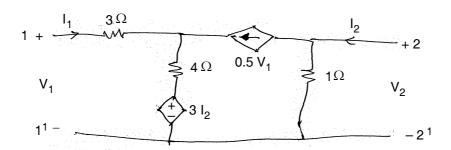
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



4) Find Z parameter of the pi network shown below.



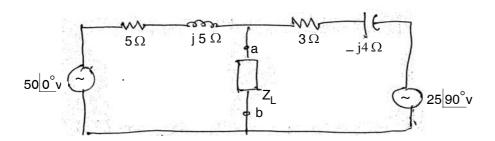
5) Determine h-parameters of the network.



3. Answer any two of the following.

 $(2 \times 6 = 12)$ 

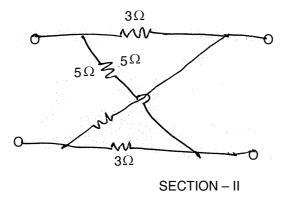
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power? What is the value of Maximum Power?



Set P

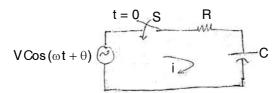


- 2) Derive the expression for maximum voltage across and inductor in series RLC circuit. Determine the Quality factor for the coil if  $R = 10 \Omega$ ,  $L = 0.1H \& C = 10 \mu$  F connected in series.
- 3) Determine the Z and h-parameters for the lattice network shown below.

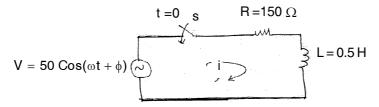


4. Solve any four: (4×4=16)

1) Derive the expression for the resultant current for the circuit shown.



- 2) What is an attenuator? State the necessity of it. Explain Lattice attenuator in detail.
- 3) Give the definition of poles and zero of the network and significance of pole and zero of the network function.
- 4) Design a band eliminate filter having a impedance of 500  $\Omega$  and cut -off frequency  $F_1$  = 1KHz and  $F_2$  = 5 KHz and also draw attenuation plot for band stop filter.
- 5) For the circuit shown, obtain the resultant when V = 50 cos (100 t +  $\phi$  ) is applied to the circuit at t = 0. Where  $\phi$  =30°

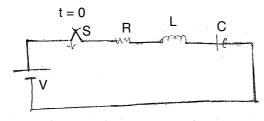


- 5. Solve any two : (2×6=12)
  - 1) Plot the pole-zero for the following system. What is the condition for stability? Comment on the stability of the system from its pole-zero plot.

i) 
$$V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$$

ii) 
$$I(s) = \frac{5s}{(s+1)(s^2+4s+8)}$$

2) For the circuit, explain the transient response in RLC circuit with DC excitation. Also derive expression for i(t), for the circuit given if  $R = 5 \Omega$ , L = 1H, C = 1F and V = 20V applied at t = 0.



3) Derive the expression for T-Type attenuator. Design at T-type pad attenuator to give an attenuation at 60 DB and to in line of 500  $\Omega$  impedance.

# **SLR-EP - 127**

Seat	
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Set Q

# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date: Saturday, 17-12-2016 Total Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

Instructions:

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

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

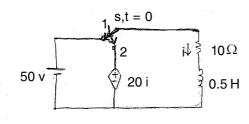
Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

- 1) The transfer impedance is defined as
  - a) The ratio of transform voltage to transform current at the same port
  - b) The ratio of transform voltage at one port to transform current at the other port
  - c) Both a & b
  - d) None of the above
- 2) The necessary condition for driving point function is
  - a) The real part of all poles and zero must not be negative
  - b) The polynomials P(s) and Q (s) may not have any missing terms between the highest and lowest degree unless all even or all odds terms are missing
  - c) The degree of P(s) and Q (s) may differ by more than one
  - d) The lowest degree of P(s) and Q (s) may differ in degree by more than two
- 3) When a series RL circuit is connected to voltage source v at t = 0, the current passing through the inductor L at t = 0 is
  - a)  $\frac{V}{D}$

- b) infinite
- c) zero
- d)  $\frac{V}{L}$
- 4) For the circuit shown current in the 10  $\Omega$  resistance when the switch is changed from 1 to 2 is



- a) 5e<sup>20t</sup>
- b) 5e<sup>-20t</sup>
- c) 20e<sup>5t</sup>
- d) 20e-5t



5)	The transient current in lo	oss free LC circuit when	exc	ited from AC sourc	e is	an sine wave.
	a) un damped		b)	over damped		
	c) under damped			critically damped		
6)	The propagation constan	t of symmetrical T-netwo	ork	is		
	a) $Cos(Y)=1+Z_1/2Z_2$		b)	$Cosh(Y) = 1 + Z_1/2Z$	<del>7</del> 2	
	c) $Cosh(Y) = 1 + Z_1/4Z_2$		d)	$Cosh(Y)=1+Z_1/Z_2$		
7)	In the M-derived low pas	s filter the resonant freq	uen	cy is to be chooser	so	that it is
	a) Above cut-off frequer	псу	b)	Below cut-off frequ	enc	cy
	c) Equal to cut-off frequ	ency	d)	None of the above		
8)	A Network has 7 nodes a	nd 5 independent loops	the	number of branche	s in	the networks is
	a) 10	b) 11	c)	12	d)	13
9)	The current source transf	formation of following cir	cuit	between AB will be	pa	rallel combination of
	15 — 3Ω W	A + A A A A A A A A A A A A A A A A A A				
	a) 5A, 3 $\Omega$	b) 5A, 2 $\Omega$	c)	–5A, 6 $\Omega$	d)	–5A, 2 $\Omega$
10)	Superposition theorem is	not valid for				
	a) Current responses		b)	Voltage responses		
	c) Power responses		d)	Both a & b		
11)	In a series resonant circ voltage?	uit, Vc = 100V, VL = 10	00V	and VR = 75V, wh	nat	is the value of source
	a) 100 V	b) 150 V	c)	0 V	d)	75 V
12)	For a given value of Q an	d Resonant frequency f	r, ba	andwidth is given by	/	
	a) fr/Q		b)	$Fr \times Q$		
	c) Q/fr		d)	None of the above		
13)	Which parameters are wi	dely used in transmissio	n li	ne theory ?		
	a) Z	b) Y	c)	h	d)	ABCD
14)	For a two port bilateral net and $C = 1/5$ , what is the		sion	line parameters are	giv	en by A = 6/5, B = 17/5
	a) 1	b) 7/5	c)	1/5	d)	5/7



Seat	
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# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date: Saturday, 17-12-2016 Marks:56

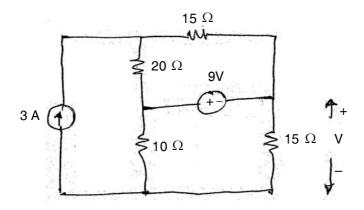
Time: 10.00 a.m. to 1.00 p.m.

#### SECTION - I

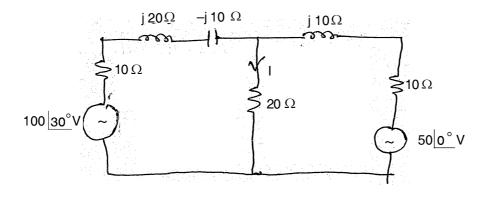
2. Answer any four of the following.

 $(4 \times 4 = 16)$ 

1) Using superposition principle, determine the value of V in the circuit shown below

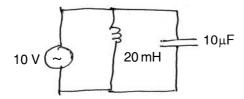


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

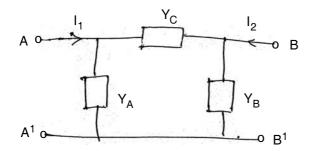




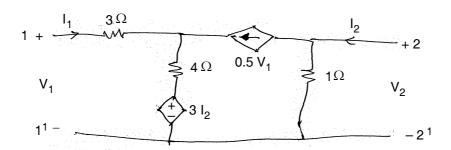
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



4) Find Z parameter of the pi network shown below.



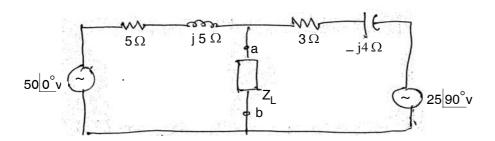
5) Determine h-parameters of the network.



3. Answer any two of the following.

 $(2 \times 6 = 12)$ 

1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power? What is the value of Maximum Power?

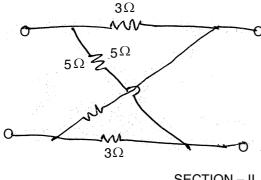


Set Q



#### -5-

- - 2) Derive the expression for maximum voltage across and inductor in series RLC circuit. Determine the Quality factor for the coil if R =  $10 \Omega$ , L=  $0.1H \& C = 10 \mu$  F connected in series.
  - 3) Determine the Z and h-parameters for the lattice network shown below.

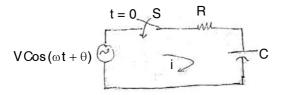


SECTION - II

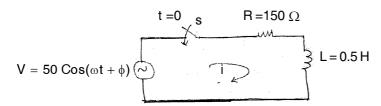
#### 4. Solve any four:

 $(4 \times 4 = 16)$ 

1) Derive the expression for the resultant current for the circuit shown.



- 2) What is an attenuator ? State the necessity of it. Explain Lattice attenuator in detail.
- 3) Give the definition of poles and zero of the network and significance of pole and zero of the network function.
- 4) Design a band eliminate filter having a impedance of 500  $\Omega$  and cut -off frequency  $F_1$  = 1KHz and  $F_2 = 5$  KHz and also draw attenvation plot for band stop filter.
- 5) For the circuit shown, obtain the resultant when  $V = 50 \cos (100 t + \phi)$  is applied to the circuit at t = 0. Where  $\phi = 30^{\circ}$

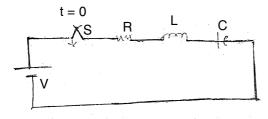


- 5. Solve any two:  $(2 \times 6 = 12)$ 
  - 1) Plot the pole-zero for the following system. What is the condition for stability? Comment on the stability of the system from its pole-zero plot.

i) 
$$V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$$

i) 
$$V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$$
 ii)  $I(s) = \frac{5s}{(s+1)(s^2+4s+8)}$ 

2) For the circuit, explain the transient response in RLC circuit with DC excitation. Also derive expression for i(t), for the circuit given if R = 5  $\Omega$ , L = 1H, C = 1F and V = 20V applied at t = 0.



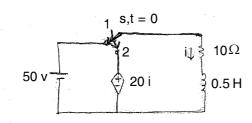
3) Derive the expression for T-Type attenuator. Design at T-type pad attenuator to give an attenuation at 60 DB and to in line of 500  $\,\Omega\,$  impedance.

# **SLR-EP - 127**

Seat		
No.	Set	R

No.					Se	et R
		S.E.	(E&TC) (Part – I) CIRCUITS	(CGPA) Examir AND NETWORK		
-		Date : Saturday, 17-1 0.00 a.m. to 1.00 p.n			Tota	al Marks : 70
			Book Page No. 3. E  Answer MCQ/Obje	ach question carries	on Page No. 3 only. Don't	
Dura	tion	: 30 Minutes	MCQ/Objec	tive Type Questions		Marks : 14
1.	Cho	oose the correct ansv	/er·			(1×14=14)
	1)	For a given value of a) fr/Q c) Q/ fr	f Q and Resonant frequ are widely used in trans	b) Fr × Q d) None of th	ne above	(
		a) Z	b) Y	c) h	d) ABCD	
	3)	For a two port bilate and $C = 1/5$ , what is		ansmission line param	eters are given by A = 6/5, B	= 17/5
		a) 1	b) 7/5	c) 1/5	d) 5/7	
	4)		nsform voltage to trans nsform voltage at one p			
	5)	<ul><li>a) The real part of</li><li>b) The polynomia lowest degree of</li><li>c) The degree of F</li></ul>	dition for driving point f all poles and zero musts as P(s) and Q (s) may unless all even or all oc P(s) and Q (s) may differ tree of P(s) and Q (s) m	st not be negative not have any missing lds terms are missing er by more than one		st and
	6)	When a series RL of inductor L at t = 0 is		oltage source v at t =	0, the current passing throu	gh the
		a) $\frac{V}{R}$	b) infinite	c) zero	a) V	

7) For the circuit shown current in the 10  $\,\Omega$  resistance when the switch is changed from 1 to 2 is

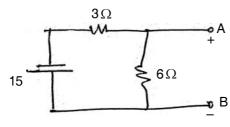


- a) 5e<sup>20t</sup>
- b) 5e<sup>-20t</sup>
- c) 20e<sup>5t</sup>
- d) 20e<sup>-5t</sup>
- 8) The transient current in loss free LC circuit when excited from AC source is an \_\_\_\_\_ sine wave.
  - a) un damped
  - c) under damped

- b) over damped
- d) critically damped
- 9) The propagation constant of symmetrical T-network is
  - a)  $Cos(Y)=1+Z_1/2Z_2$
  - c)  $Cosh(Y) = 1 + Z_1/4Z_2$

- b)  $Cosh(Y) = 1 + Z_1/2Z_2$
- d)  $Cosh(Y)=1+Z_1/Z_2$
- 10) In the M-derived low pass filter the resonant frequency is to be choosen so that it is
  - a) Above cut-off frequency

- b) Below cut-off frequency
- c) Equal to cut-off frequency
- d) None of the above
- 11) A Network has 7 nodes and 5 independent loops the number of branches in the networks is
  - a) 10
- b) 11
- c) 12
- d) 13
- 12) The current source transformation of following circuit between AB will be parallel combination of



- a) 5A, 3  $\Omega$
- b) 5A, 2  $\Omega$
- c) -5A, 6  $\Omega$
- d) -5A, 2  $\Omega$

- 13) Superposition theorem is not valid for
  - a) Current responses

b) Voltage responses

c) Power responses

- d) Both a & b
- 14) In a series resonant circuit, Vc = 100V, VL = 100V and VR = 75V, what is the value of source voltage?
  - a) 100 V
- b) 150 V
- c) 0 V
- d) 75 V



Seat	
No.	

# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date: Saturday, 17-12-2016 Marks:56

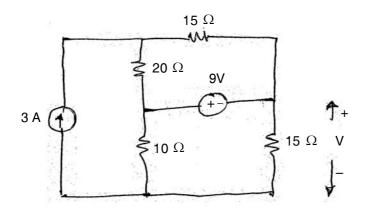
Time: 10.00 a.m. to 1.00 p.m.

#### SECTION - I

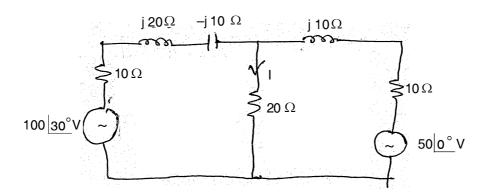
2. Answer any four of the following.

 $(4 \times 4 = 16)$ 

1) Using superposition principle, determine the value of V in the circuit shown below

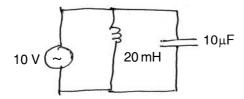


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

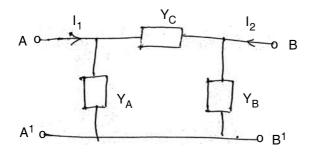




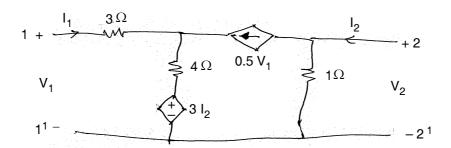
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



4) Find Z parameter of the pi network shown below.



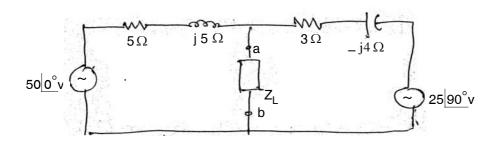
5) Determine h-parameters of the network.



3. Answer any two of the following.

 $(2 \times 6 = 12)$ 

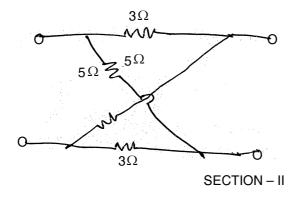
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power? What is the value of Maximum Power?



Set R



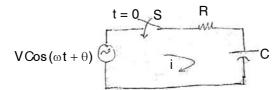
- 2) Derive the expression for maximum voltage across and inductor in series RLC circuit. Determine the Quality factor for the coil if  $R = 10 \Omega$ ,  $L = 0.1H \& C = 10 \mu$  F connected in series.
- 3) Determine the Z and h-parameters for the lattice network shown below.



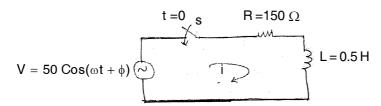
4. Solve any four:

 $(4 \times 4 = 16)$ 

1) Derive the expression for the resultant current for the circuit shown.



- 2) What is an attenuator? State the necessity of it. Explain Lattice attenuator in detail.
- 3) Give the definition of poles and zero of the network and significance of pole and zero of the network function.
- 4) Design a band eliminate filter having a impedance of 500  $\Omega$  and cut -off frequency  $F_1$  = 1KHz and  $F_2$  = 5 KHz and also draw attenvation plot for band stop filter.
- 5) For the circuit shown, obtain the resultant when V = 50 cos (100 t +  $\phi$ ) is applied to the circuit at t = 0. Where  $\phi$  =30°



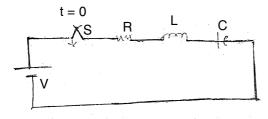


- 5. Solve any two:  $(2 \times 6 = 12)$ 
  - 1) Plot the pole-zero for the following system. What is the condition for stability? Comment on the stability of the system from its pole-zero plot.

$$i)$$
  $V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$ 

i) 
$$V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$$
 ii)  $I(s) = \frac{5s}{(s+1)(s^2+4s+8)}$ 

2) For the circuit, explain the transient response in RLC circuit with DC excitation. Also derive expression for i(t), for the circuit given if R = 5  $\Omega$ , L = 1H, C = 1F and V = 20V applied at t = 0.



3) Derive the expression for T-Type attenuator. Design at T-type pad attenuator to give an attenuation at 60 DB and to in line of 500  $\,\Omega\,$  impedance.

# **SLR-EP - 127**

Seat	
No.	

Set S

# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date: Saturday, 17-12-2016

Total Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

Instructions:

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

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

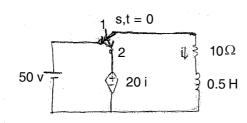
Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

- 1) When a series RL circuit is connected to voltage source v at t = 0, the current passing through the inductor L at t = 0 is
  - a)  $\frac{V}{R}$

- b) infinite
- c) zero
- d)  $\frac{V}{L}$
- 2) For the circuit shown current in the 10  $\Omega$  resistance when the switch is changed from 1 to 2 is



- a) 5e<sup>20t</sup>
- b) 5e<sup>-20t</sup>
- c) 20e<sup>5t</sup>
- d) 20e<sup>-5t</sup>
- 3) The transient current in loss free LC circuit when excited from AC source is an \_\_\_\_\_ sine wave.
  - a) un damped

b) over damped

c) under damped

- d) critically damped
- 4) The propagation constant of symmetrical T-network is
  - a)  $Cos(Y)=1+Z_1/2Z_2$

b)  $Cosh(Y) = 1+Z_1/2Z_2$ 

c)  $Cosh(Y) = 1 + Z_1/4Z_2$ 

- d)  $Cosh(Y)=1+Z_1/Z_2$
- 5) In the M-derived low pass filter the resonant frequency is to be choosen so that it is
  - a) Above cut-off frequency

- b) Below cut-off frequency
- c) Equal to cut-off frequency
- d) None of the above



6)	A Network has 7 nodes a	and 5 independent loops	the	number of branche	s ir	the networks is
	a) 10	b) 11	c)	12	d)	13
7)	The current source trans	formation of following ci	rcui	t between AB will be	pa	rallel combination of
	15 3Ω 3Ω M	\$ 6Ω B				
	a) 5A, 3 $\Omega$	b) 5A, 2 $\Omega$	c)	–5A, 6 $\Omega$	d)	–5A, 2 $\Omega$
8)	Superposition theorem is a) Current responses	s not valid for		Voltage responses Both a & b		
0/	c) Power responses		,			:
9)	In a series resonant circ voltage?	cuit, $VC = 100V$ , $VL = 10$	UUV	and VH = 75V, Wr	nat	is the value of source
	a) 100 V	b) 150 V	c)	0 V	d)	75 V
10)	For a given value of Q ar	nd Resonant frequency f	r, b	andwidth is given by	/	
	a) fr/Q		b)	$Fr \times Q$		
	c) Q/fr		d)	None of the above		
11)	Which parameters are w	idely used in transmissio	on li	ne theory ?		
	a) Z	b) Y	c)	h	d)	ABCD
12)	For a two port bilateral ne and $C = 1/5$ , what is the		sior	ı line parameters are	giv	ven by A = 6/5, B = 17/5
	a) 1	b) 7/5	c)	1/5	d)	5/7
13)	The transfer impedance	is defined as				
	a) The ratio of transform	n voltage to transform c	urre	nt at the same port		
	b) The ratio of transform	n voltage at one port to t	ran	sform current at the	oth	ner port
	c) Both a & b					
	d) None of the above					

- 14) The necessary condition for driving point function is
  - a) The real part of all poles and zero must not be negative
  - b) The polynomials P(s) and Q (s) may not have any missing terms between the highest and lowest degree unless all even or all odds terms are missing
  - c) The degree of P(s) and Q(s) may differ by more than one
  - d) The lowest degree of P(s) and Q(s) may differ in degree by more than two



Seat	
No.	

# S.E. (E&TC) (Part – I) (CGPA) Examination, 2016 CIRCUITS AND NETWORKS

Day and Date: Saturday, 17-12-2016 Marks:56

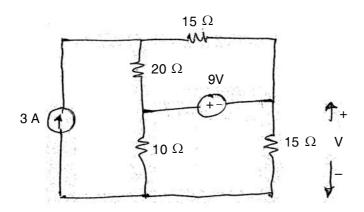
Time: 10.00 a.m. to 1.00 p.m.

SECTION - I

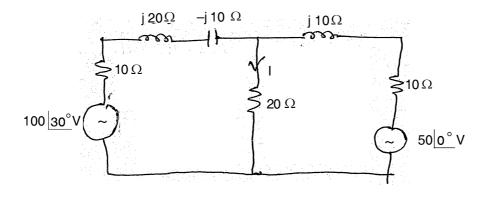
2. Answer any four of the following.

 $(4 \times 4 = 16)$ 

1) Using superposition principle, determine the value of V in the circuit shown below

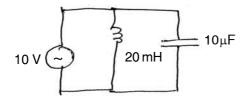


2) Draw the Norton's equivalent circuit for the network shown and hence find the current I

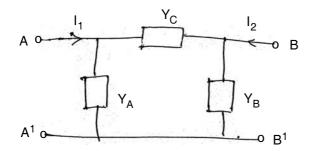




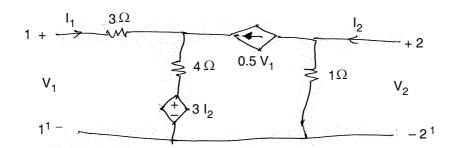
3) Derive an expression for resonant frequency for Parallel RLC circuit and hence find the resonant frequency for the circuit shown below.



4) Find Z parameter of the pi network shown below.



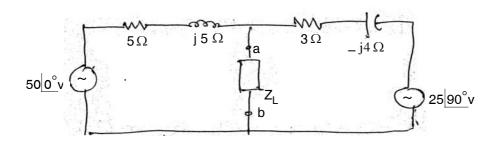
5) Determine h-parameters of the network.



3. Answer any two of the following.

 $(2 \times 6 = 12)$ 

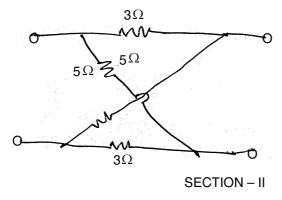
1) In the network shown two voltage sources act on a load impedance connected to the terminal a &b. If this load is variable in both reactance and resistance, what load ZL will receive the maximum power? What is the value of Maximum Power?



Set S

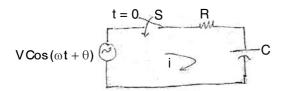


- 2) Derive the expression for maximum voltage across and inductor in series RLC circuit. Determine the Quality factor for the coil if  $R = 10 \Omega$ ,  $L = 0.1H \& C = 10 \mu$  F connected in series.
- 3) Determine the Z and h-parameters for the lattice network shown below.

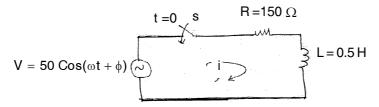


4. Solve any four: (4×4=16)

1) Derive the expression for the resultant current for the circuit shown.



- 2) What is an attenuator? State the necessity of it. Explain Lattice attenuator in detail.
- Give the definition of poles and zero of the network and significance of pole and zero of the network function.
- 4) Design a band eliminate filter having a impedance of 500  $\Omega$  and cut -off frequency  $F_1$  = 1KHz and  $F_2$  = 5 KHz and also draw attenvation plot for band stop filter.
- 5) For the circuit shown, obtain the resultant when V = 50 cos (100 t +  $\phi$  ) is applied to the circuit at t = 0. Where  $\phi$  =30°



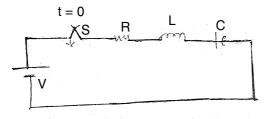


- 5. Solve any two:  $(2 \times 6 = 12)$ 
  - 1) Plot the pole-zero for the following system. What is the condition for stability? Comment on the stability of the system from its pole-zero plot.

$$i)$$
  $V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$ 

i) 
$$V(s) = \frac{4(s+2)s}{(s+1)(s+3)}$$
 ii)  $I(s) = \frac{5s}{(s+1)(s^2+4s+8)}$ 

2) For the circuit, explain the transient response in RLC circuit with DC excitation. Also derive expression for i(t), for the circuit given if R = 5  $\Omega$ , L = 1H, C = 1F and V = 20V applied at t = 0.



3) Derive the expression for T-Type attenuator. Design at T-type pad attenuator to give an attenuation at 60 DB and to in line of 500  $\,\Omega\,$  impedance.

				<b>SLR-EP - 128</b>
Seat No.				Set P
		• • • • • • • • • • • • • • • • • • • •	art – I) Examination, : CHNIQUES (CGPA Pa	
	nd Date : Tuesd 10.00 a.m. to 1	ay, 20-12-2016 .00 p.m.		Total Marks : 70
	Instructions:	in Answer Bo 2) <b>Answer MCG</b>	mpulsory. It should be solow Page No. 3. Each question NObjective type question No mention, Q.P. Set (P/Q	stion carries <b>one</b> mark. <b>ns on Page No. 3 only.</b>
Duration	on : 30 Minutes	MCQ/Obje	ctive Type Questions	Marks : 14
1. Cł	noose the corre	ct answer :		(14×1=14)
1)	<ul><li>Gray code is</li><li>a) Non weigh</li><li>c) Reflected</li></ul>		b) Cyclic code d) All the above	
2)	) A circuit that t a) Multiplexe		nal to binary code is plexer c) Decoder	d) Encoder
3)	<ul><li>a) BCD to 7-s</li><li>b) BCD to 7-s</li><li>c) Negative s</li></ul>	segment decoder segment decoder supply voltage for upply voltage for th	common anode requires with active-low outputs with active-high outputs the anode ne anode and BCD to 7-se	egment decoder with
4)	<ul><li>a) Increase the</li><li>b) Decrease</li><li>c) Facilitate a</li></ul>	TL gates, the totene noise margin of the noise margin of the output switch a wired or logic cone output impeda	ing delay onnection	rimarily used to
5)			one shot flip-flop is	-1\ 4
6	a) 1 ) What is the co	b) 2 andition for race a	c) 3 around problem ?	d) 4
<b>O</b> ,	a) J=K=1	b) $\Delta t < t_p$	•	d) None
7	) The logic exp	•	B, C) = $\Sigma$ m (0, 2, 3, 6) is	equivalent to

b)  $\pi M (0, 3, 5, 6, 7)$ 

d) None

a)  $\Sigma m (1, 4, 5, 7)$ 

c)  $\Sigma m (1, 2, 4)$ 



8)	A divide by 20 Ring a) Twenty flip flops c) Five flip flops	•	a minimum of b) Eight flip flops d) None of these	
9)	The initial content o in figure is 0110. Aft will be ?	•	. •	shift register shown ents of shift register
	Clock Serial in —	OII		
	a) 0000	b) 0101	c) 1010	d) 1111
10)	A 4-bit asynchrono 25 ns each. The ma a) 25 ns			•
11)	•	n as counter beco	omes maximum 11	ne preset operation 11. The modulus of
	a) 5	b) 10	c) 11	d) 15
12)	The minimum numb	per of flip-flops req	uired to generate a	sequence of 11 bits
	a) 3	b) 4	c) 5	d) 2
13)	State reduction give a) Reduction in nu c) Either (a) or (b)		b) Number of flip- d) None of these	flop remain same
14)	In PLA a) Both AND and C	)R matrix are proq	rammable	

- a) Doll AND and OR matrix are programmable
   b) AND array is fixed and OR is programmable
   c) AND is programmable OR is fixed
- d) None of the above



Seat	
No.	

# S.E. (E & TC) (Part – I) Examination, 2016 SUB-DIGITAL TECHNIQUES (CGPA Pattern)

Day and Date: Tuesday, 20-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

#### 2. Solve any four:

 $(4 \times 4 = 16)$ 

a) Reduce the following logical expression using K-map and implement reduced expression by using NAND gate.

$$F(A, B, C, D) = \pi M (1, 4, 6, 9, 10, 11, 14, 15)$$

- b) Implement 8:1 MUX by using 2:1 MUX.
- c) Implement the following function using single 8: 1 multiplexer

$$F(A, B, C, D) = \sum m(0, 3, 5, 6, 8, 9, 14, 15)$$

- d) Convert T flip flop into D flip-flop.
- e) Draw and explain CMOS inverter.

# 3. Solve any two:

 $(2\times6=12)$ 

a) Minimize the following function using K-map & implement reduced expression using NOR gate.

- b) Draw & Explain Subtractor using adder IC 7483 (Use 2's Complement Method).
- c) Find out the characteristic equation of
  - i) S-R Flip flop
- ii) T Flip flop
- iii) J-K Flip flop

#### SECTION - II

### 4. Solve any four:

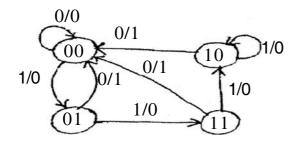
 $(4 \times 4 = 16)$ 

- a) Draw the waveforms to shift data 1101 to left in serial out shift register.
- b) Design MOD-5 asychronous counter.
- c) Design MOD-10 down counter using IC 74191.
- d) Compare Moore & Mealy machines.
- e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.



5. Solve **any two**: (2×6=12)

- a) Design a 3-bit synchronous up/down counter using J-K flip flop.
- b) Design a sequential circuit using D flip flop for the given state diagram.



c) A combinational circuit having 2 outputs F & G are given by the Sum of Product expression as below

$$F = W \overline{Y} + X \overline{Y} Z$$

$$G = W \overline{X} \overline{Y} + \overline{X} Z + \overline{W} \overline{Y} Z$$

Where W, X, Y, Z are input to the system. Implement this circuit using PLA having no more than four product terms.

Seat	
No.	

Set Q

# S.E. (E & TC) (Part – I) Examination, 2016 SUB-DIGITAL TECHNIQUES (CGPA Pattern)

Day and Date: Tuesday, 20-12-2016 Total Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

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

# **MCQ/Objective Type Questions**

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

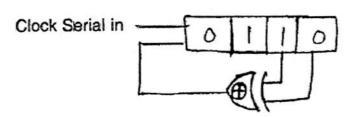
 $(14 \times 1 = 14)$ 

- 1) A divide by 20 Ring counter requires a minimum of
  - a) Twenty flip flops

b) Eight flip flops

c) Five flip flops

- d) None of these
- 2) The initial content of 4-bit serial-in-parallel out, right shift, shift register shown in figure is 0110. After three clock pulses are applied contents of shift register will be ?



- a) 0000
- b) 0101
- c) 1010
- d) 1111
- 3) A 4-bit asynchronous counter uses flip-flop with propagation delay time of 25 ns each. The max possible time required for change of state will be
  - a) 25 ns
- b) 50 ns
- c) 75 ns
- d) 100 ns
- 4) A 4-bit presettable up counter has preset input 0101. The preset operation takes place as soon as counter becomes maximum 1111. The modulus of counter is
  - a) 5
- b) 10
- c) 11
- d) 15
- 5) The minimum number of flip-flops required to generate a sequence of 11 bits is
  - a) 3
- b) 4
- c) 5
- d) 2



6)	State reduction gives a) Reduction in number of flip-flops c) Either (a) or (b)	<ul><li>b) Number of flip-f</li><li>d) None of these</li></ul>	lop remain same
7)	In PLA a) Both AND and OR matrix are programmable OR is programmable OR is fixed d) None of the above	rammable	
8)	Gray code is a) Non weighted code c) Reflected code	b) Cyclic code d) All the above	
9)	A circuit that transforms decimal to bi a) Multiplexer b) Demultiplexer	_	d) Encoder
10)	<ul> <li>A 7-segment LED display with common</li> <li>a) BCD to 7-segment decoder with active supply voltage for the anotactive-low output</li> </ul>	ctive-low outputs ctive-high outputs ode	gment decoder with
11)	In standard TTL gates, the totem-pole a) Increase the noise margin of the gate b) Decrease the output switching delac c) Facilitate a wired or logic connection d) Increase the output impedance of	ate ay on	marily used to
12)	The number of stable states in one sha) 1 b) 2	not flip-flop is c) 3	d) 4
13)	What is the condition for race around a) $J=K=1$ b) $\Delta t < t_{D}$	problem ? c) Both	d) None
14)	The logic expression for $Y(A, B, C) = a$ a) $\Sigma m (1, 4, 5, 7)$ c) $\Sigma m (1, 2, 4)$		



Seat	
No.	

# S.E. (E & TC) (Part – I) Examination, 2016 SUB-DIGITAL TECHNIQUES (CGPA Pattern)

Day and Date: Tuesday, 20-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

a) Reduce the following logical expression using K-map and implement reduced expression by using NAND gate.

$$F(A, B, C, D) = \pi M (1, 4, 6, 9, 10, 11, 14, 15)$$

- b) Implement 8:1 MUX by using 2:1 MUX.
- c) Implement the following function using single 8: 1 multiplexer

$$F(A, B, C, D) = \Sigma m(0, 3, 5, 6, 8, 9, 14, 15)$$

- d) Convert T flip flop into D flip-flop.
- e) Draw and explain CMOS inverter.

# 3. Solve any two:

 $(2\times6=12)$ 

a) Minimize the following function using K-map & implement reduced expression using NOR gate.

- b) Draw & Explain Subtractor using adder IC 7483 (Use 2's Complement Method).
- c) Find out the characteristic equation of
  - i) S-R Flip flop
- ii) T Flip flop
- iii) J-K Flip flop

#### SECTION - II

### 4. Solve any four:

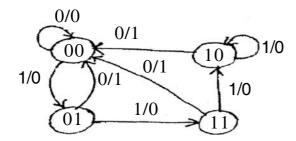
 $(4 \times 4 = 16)$ 

- a) Draw the waveforms to shift data 1101 to left in serial out shift register.
- b) Design MOD-5 asychronous counter.
- c) Design MOD-10 down counter using IC 74191.
- d) Compare Moore & Mealy machines.
- e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.



5. Solve any two: (2×6=12)

- a) Design a 3-bit synchronous up/down counter using J-K flip flop.
- b) Design a sequential circuit using D flip flop for the given state diagram.



c) A combinational circuit having 2 outputs F & G are given by the Sum of Product expression as below

$$F = W \overline{Y} + X \overline{Y} Z$$

$$G = W \overline{X} \overline{Y} + \overline{X} Z + \overline{W} \overline{Y} Z$$

Where W, X, Y, Z are input to the system. Implement this circuit using PLA having no more than four product terms.

Set Q

**SLR-EP - 128** 

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Set R

# S.E. (E & TC) (Part – I) Examination, 2016 SUB-DIGITAL TECHNIQUES (CGPA Pattern)

Day and Date: Tuesday, 20-12-2016 Total Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

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

# **MCQ/Objective Type Questions**

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(14 \times 1 = 14)$ 

- 1) The number of stable states in one shot flip-flop is
  - a) 1
- b) 2
- c) 3
- d) 4
- 2) What is the condition for race around problem?
  - a) J=K=1
- b)  $\Delta t < t_n$
- c) Both
- d) None
- 3) The logic expression for  $Y(A, B, C) = \sum m (0, 2, 3, 6)$  is equivalent to
  - a)  $\Sigma m (1, 4, 5, 7)$

b)  $\pi M (0, 3, 5, 6, 7)$ 

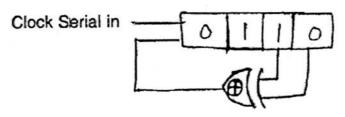
c)  $\Sigma m (1, 2, 4)$ 

- d) None
- 4) A divide by 20 Ring counter requires a minimum of
  - a) Twenty flip flops

b) Eight flip flops

c) Five flip flops

- d) None of these
- 5) The initial content of 4-bit serial-in-parallel out, right shift, shift register shown in figure is 0110. After three clock pulses are applied contents of shift register will be ?



- a) 0000
- b) 0101
- c) 1010
- d) 1111
- 6) A 4-bit asynchronous counter uses flip-flop with propagation delay time of 25 ns each. The max possible time required for change of state will be
  - a) 25 ns
- b) 50 ns
- c) 75 ns
- d) 100 ns



7)	A 4-bit presettable takes place as soo counter is		-			<u>-</u>
	a) 5	b) 10	c) 11		d)	15
8)	The minimum numb	per of flip-flops requ	uired to ger	nerate a s	seq	uence of 11 bits
	a) 3	b) 4	c) 5		d)	2
9)	State reduction give a) Reduction in nu c) Either (a) or (b)		b) Numbe d) None o	•	flop	remain same
10)	In PLA a) Both AND and C b) AND array is fixe c) AND is program d) None of the above	ed and OR is prog mable OR is fixed				
11)	Gray code is <ul><li>a) Non weighted co</li><li>c) Reflected code</li></ul>	ode	b) Cyclic od) All the a			
12)	A circuit that transfe a) Multiplexer	orms decimal to bi b) Demultiplexer	•		d)	Encoder
13)	A 7-segment LED of a) BCD to 7-segment b) BCD to 7-segment b) BCD to 7-segment b) Negative supply d) Positive supply active-low output	ent decoder with ac ent decoder with ac voltage for the and voltage for the anoc	ctive-low ou ctive-high o ode	utputs outputs	gme	ent decoder with
14)	In standard TTL ga a) Increase the noi b) Decrease the ou c) Facilitate a wire d) Increase the out	se margin of the garte of the switching delay or logic connection	ate ay on	ge is pri	maı	rily used to



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# S.E. (E & TC) (Part – I) Examination, 2016 SUB-DIGITAL TECHNIQUES (CGPA Pattern)

Day and Date: Tuesday, 20-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

a) Reduce the following logical expression using K-map and implement reduced expression by using NAND gate.

$$F(A, B, C, D) = \pi M (1, 4, 6, 9, 10, 11, 14, 15)$$

- b) Implement 8:1 MUX by using 2:1 MUX.
- c) Implement the following function using single 8: 1 multiplexer

$$F(A, B, C, D) = \Sigma m(0, 3, 5, 6, 8, 9, 14, 15)$$

- d) Convert T flip flop into D flip-flop.
- e) Draw and explain CMOS inverter.

### 3. Solve any two:

 $(2\times6=12)$ 

a) Minimize the following function using K-map & implement reduced expression using NOR gate.

- b) Draw & Explain Subtractor using adder IC 7483 (Use 2's Complement Method).
- c) Find out the characteristic equation of
  - i) S-R Flip flop
- ii) T Flip flop
- iii) J-K Flip flop

#### SECTION - II

### 4. Solve any four:

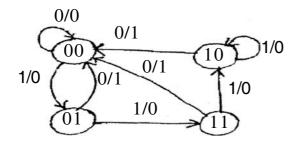
 $(4 \times 4 = 16)$ 

- a) Draw the waveforms to shift data 1101 to left in serial out shift register.
- b) Design MOD-5 asychronous counter.
- c) Design MOD-10 down counter using IC 74191.
- d) Compare Moore & Mealy machines.
- e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.



5. Solve any two: (2×6=12)

- a) Design a 3-bit synchronous up/down counter using J-K flip flop.
- b) Design a sequential circuit using D flip flop for the given state diagram.



c) A combinational circuit having 2 outputs F & G are given by the Sum of Product expression as below

$$F = W \overline{Y} + X \overline{Y} Z$$

$$G = W \overline{X} \overline{Y} + \overline{X} Z + \overline{W} \overline{Y} Z$$

Where W, X, Y, Z are input to the system. Implement this circuit using PLA having no more than four product terms.

Set R

# 8

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	•	k TC) (Part – I) AL TECHNIQ				L	
Day and Date : Time : 10.00 a	• •				Tota	l Marl	ks : 70
Instruc	in Aı 2) <b>Ans</b>	lo. <b>1</b> is <b>compulso</b> nswer Book Page <b>wer MCQ/Objec</b> ' <b>t forget to ment</b>	e N tivo	o. <b>3. Each</b> quest e type questions	tion carries <b>o</b> <b>s on Page N</b>	one m lo. 3 o	nark. <b>only.</b>
Duration: 30 M		CQ/Objective Ty	/pe	Questions		Marl	ks : 14
1. Choose th	e correct answ	er:				(14×	<b>(1=14)</b>
•	each. The max	s counter uses fli possible time red ) 50 ns	qui		-		of
-	olace as soon a	counter has pre as counter becor					
a) 5	_	) 10	c)	11	d) 15		
3) The mi	nimum numbe	r of flip-flops requ	uire	d to generate a s	sequence of	f 11 bi	ts
a) 3	b	) 4	c)	5	d) 2		
a) Red	eduction gives duction in numb ner (a) or (b)	• •	,	Number of flip-f None of these	lop remain s	same	
b) AN c) AN	D array is fixed	matrix are progrand OR is prograble OR is fixed					
•	ode is nweighted code lected code		,	Cyclic code All the above			

7) A circuit that transforms decimal to binary code is

b) Demultiplexer c) Decoder

a) Multiplexer

d) Encoder



- 8) A 7-segment LED display with common anode requires
  - a) BCD to 7-segment decoder with active-low outputs
  - b) BCD to 7-segment decoder with active-high outputs
  - c) Negative supply voltage for the anode
  - d) Positive supply voltage for the anode and BCD to 7-segment decoder with active-low output
- 9) In standard TTL gates, the totem-pole output stage is primarily used to
  - a) Increase the noise margin of the gate
  - b) Decrease the output switching delay
  - c) Facilitate a wired or logic connection
  - d) Increase the output impedance of the circuit
- 10) The number of stable states in one shot flip-flop is
  - a) 1

- b) 2
- c) 3
- d) 4
- 11) What is the condition for race around problem?
  - a) J=K=1
- b)  $\Delta t < t_p$
- c) Both
- d) None
- 12) The logic expression for  $Y(A, B, C) = \sum m (0, 2, 3, 6)$  is equivalent to
  - a)  $\Sigma$  m (1, 4, 5, 7)

b)  $\pi M (0, 3, 5, 6, 7)$ 

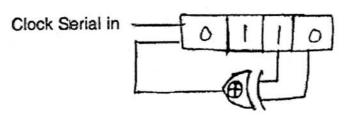
c)  $\Sigma$  m (1, 2, 4)

- d) None
- 13) A divide by 20 Ring counter requires a minimum of
  - a) Twenty flip flops

b) Eight flip flops

c) Five flip flops

- d) None of these
- 14) The initial content of 4-bit serial-in-parallel out, right shift, shift register shown in figure is 0110. After three clock pulses are applied contents of shift register will be ?



- a) 0000
- b) 0101
- c) 1010
- d) 1111



Seat	
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# S.E. (E & TC) (Part – I) Examination, 2016 SUB-DIGITAL TECHNIQUES (CGPA Pattern)

Day and Date: Tuesday, 20-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

a) Reduce the following logical expression using K-map and implement reduced expression by using NAND gate.

$$F(A, B, C, D) = \pi M (1, 4, 6, 9, 10, 11, 14, 15)$$

- b) Implement 8: 1 MUX by using 2: 1 MUX.
- c) Implement the following function using single 8: 1 multiplexer

$$F(A, B, C, D) = \sum m(0, 3, 5, 6, 8, 9, 14, 15)$$

- d) Convert T flip flop into D flip-flop.
- e) Draw and explain CMOS inverter.

# 3. Solve any two:

 $(2\times6=12)$ 

a) Minimize the following function using K-map & implement reduced expression using NOR gate.

- b) Draw & Explain Subtractor using adder IC 7483 (Use 2's Complement Method).
- c) Find out the characteristic equation of
  - i) S-R Flip flop
- ii) T Flip flop
- iii) J-K Flip flop

#### SECTION - II

### 4. Solve any four:

 $(4 \times 4 = 16)$ 

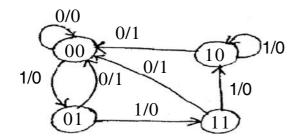
- a) Draw the waveforms to shift data 1101 to left in serial out shift register.
- b) Design MOD-5 asychronous counter.
- c) Design MOD-10 down counter using IC 74191.
- d) Compare Moore & Mealy machines.
- e) Draw the state diagram & give the state table for sequence detector which detects the sequence 1011.



5. Solve **any two**:

 $(2 \times 6 = 12)$ 

- a) Design a 3-bit synchronous up/down counter using J-K flip flop.
- b) Design a sequential circuit using D flip flop for the given state diagram.



c) A combinational circuit having 2 outputs F & G are given by the Sum of Product expression as below

$$F = W \overline{Y} + X \overline{Y} Z$$

$$G = W \overline{X} \overline{Y} + \overline{X} Z + \overline{W} \overline{Y} Z$$

Where W, X, Y, Z are input to the system. Implement this circuit using PLA having no more than four product terms.

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	3.E. (E & 1	DATA STRU		•		)II, 2016	
-	and Date: Thurso: 10.00 a.m. to	-				Max. Max.	arks : 70
		<ol> <li>Q. No. 1 is comminutes in Anone mark.</li> <li>Answer MCQ/Don't forget to</li> </ol>	swer Boo <b>Objectiv</b>	k Page l <b>e type q</b>	No. <b>3. Each</b> o u <b>estions on</b>	question ca <b>Page No. 3</b>	rries <b>3 only.</b>
		MCQ/Objec	tive Type	<b>Questi</b>	ons		
Dura	tion : 30 Minutes					Ma	arks : 14
1. C	Choose the corre	ct answer :				(1	4×1=14)
1	) In linked lists t a) Singly Link c) Circular Lii		b)	-	Linked List f the above		
2	P) Recursively th a) 2	e fib(5) is b) 3	c)	5	d) 8	8	
3	b) To allocate c) To dealloc	ion is used to ate memory dynare memory staticall ate memory static	y ally				
4	<ul><li>a) Placing an</li><li>b) Placing an</li></ul>	ment to the stack relement at the from element at the tope element at the read above	ont end o				
5	i) The end from ( a) Front	which an element b) Rear	_	oved fro Top	· · · · · · · · · · · · · · · · · · ·	e is called Bottom	
6	•	is the application of sub program	b)		rsion of infix f the above	to postfix	



7)	Queue follows algorithm a) FIFO b) LIFO c) RANDOM d) LILO	
8)	A hash function f defined as $f(key) = key \mod 13$ , with linear probing is usinsert keys 55,58,68,91,27,145. What will be the location of 79?  a) 1 b) 2 c) 3 d) 5	sed to
9)	<ul> <li>Which of the following is not a limitation of binary search algorithm?</li> <li>a) must use a sorted array</li> <li>b) requirement of sorted array is expensive when a lot of insertion deletions are needed</li> <li>c) there must be a mechanism to access middle element directly</li> <li>d) binary search algorithm is not efficient when the data elements more 1500</li> </ul>	
10)	If the given input array is sorted or nearly sorted, which of the folloalgorithm gives the best performance?  a) Insertion sort b) Selection sort c) Quick sort d) Merge so	
11)	The running time of the following sorting algorithm depends on wheth partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c) Quick sort d) Merge so	
12)	If the inorder and preorder traversal of a binary tree are D, B, F, E, G, F, and A, B, D, E, F, G, H, C respectively then the postorder traversal tree is  a) D, F, G, A, B, C, H, E  b) F, H, D, G, E, B, C, A  c) C, G, H, F, E, D, B, A  d) D, F, H, G, E, B, C, A	
13)	Graph traversal is different from a tree traversal, because a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph	
14)	A binary search tree in which the nodes have been inserted in the follorder:	owing
	25,15,35,10,20,30,40. Which of the following is the result of a post traversal of the original tree?  a) 10 15 20 30 35 40 25 b) 25 15 10 20 35 30 40 c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 10	order



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## S.E. (E & TC) (Part – I) (CGPA Pattern) Examination, 2016 DATA STRUCTURES USING 'C'

Day and Date: Thursday, 22-12-2016

Time: 10.00 a.m. to 1.00 p.m.

SECTION - I

### 2. Attempt any four questions:

 $(4 \times 3 = 12)$ 

Marks: 56

- 1) What is stack? Write an algorithm of push operation of stack.
- 2) Write a note on Priority Queue.
- 3) Write a 'C' program to find the GCD of two numbers with recursive functions.
- 4) Define the function to check overflow and underflow condition of queue.
- 5) Explain doubly linked list with neat diagram.

#### 3. Attempt any one question:

8

- 1) Write the algorithm to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A+B  $^{\land}$  D)/(E F) + G.
- 2) Explain singly linked list and write algorithm for following operation
  - a) Insert at specified location
  - b) Delete at end
  - c) Display list elements.

#### 4. Attempt the question:

8

Write a program to implement stack using array, with following functions:emptystack, fullstack, push, pop, display.



5. Attempt any four questions:

 $(4 \times 3 = 12)$ 

- 1) How to represent a graph using adjacency list?
- 2) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.

14, 33, 27, 10, 35, 19, 42, 44

- 3) Define Hashing. Explain following hash function with example.
  - a) Truncation
- b) Mid-square method.
- 4) Create a binary search tree from the following keys

50, 30, 60, 38, 35, 55, 22, 59, 94, 13, 98

- 5) Compare Binary Search with linear search.
- 6. Solve any one question:

8

1) Explain quick sort. Sort the following sequence in ascending order using quick sort.

48, 44, 19, 59, 72, 80, 42, 65, 82, 8, 95, 68

- 2) What do you mean by hashing? Explain different open addressing techniques to resolve collision in detail by giving suitable examples.
- 7. Explain graph traversal methods with examples.

8

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## S.E. (E & TC) (Part – I) (CGPA Pattern) Examination, 2016 DATA STRUCTURES USING 'C'

Day and Date: Thursday, 22-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

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

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

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(14 \times 1 = 14)$ 

- 1) A hash function f defined as f(key) = key mod13, with linear probing is used to insert keys 55,58,68,91,27,145. What will be the location of 79?
  - a) 1
- b) 2
- c) 3
- d) 5
- 2) Which of the following is not a limitation of binary search algorithm?
  - a) must use a sorted array
  - b) requirement of sorted array is expensive when a lot of insertion and deletions are needed
  - c) there must be a mechanism to access middle element directly
  - d) binary search algorithm is not efficient when the data elements more than 1500
- 3) If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?
  - a) Insertion sort
- b) Selection sort c) Quick sort
- d) Merge sort
- 4) The running time of the following sorting algorithm depends on whether the partitioning is balanced or unbalanced
  - a) Insertion sort
- b) Selection sort c) Quick sort
- d) Merge sort
- 5) If the inorder and preorder traversal of a binary tree are D, B, F, E, G, H, A, C and A, B, D, E, F, G, H, C respectively then the postorder traversal of that tree is
  - a) D, F, G, A, B, C, H, E
- b) F, H, D, G, E, B, C, A
- c) C, G, H, F, E, D, B, A
- d) D, F, H, G, E, B, C, A



6)	<ul> <li>Graph traversal is different fro</li> <li>a) trees are not connected</li> <li>b) graphs may have loops</li> <li>c) trees have root</li> <li>d) None is true as tree is a su</li> </ul>			ause	
7)	A binary search tree in which order:	the nodes h	ave been in	serted in t	he following
	25,15,35,10,20,30,40. Which traversal of the original tree? a) 10 15 20 30 35 40 25 c) 10 15 20 25 30 35 40	b) 2	wing is the 25 15 10 2 40 35 30 2	20 35 30	40
8)	In linked lists there are no NU a) Singly Linked List c) Circular Linked List	b) I	Doubly Link None of the		
9)	Recursively the fib(5) is a) 2 b) 3	c) {	5	d) 8	
10)	Malloc () function is used to a) To deallocate memory dyn b) To allocate memory static c) To deallocate memory sta d) To allocate memory dynar	ally tically			
l1)	Adding an element to the stack a) Placing an element at the tale b) Placing an element at the tale c) Placing an element at the tale d) None of the above	front end top			
12)	The end from which an element a) Front b) Rear	nt gets remo c)		e queue is d) Bo	
13)	a) Execution of sub program c) Both a), b)	b) (	Conversion None of the		postfix
14)	Queue follows algorithm a) FIFO b) LIFO	c) !	RANDOM	d) LIL	.0



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## S.E. (E & TC) (Part – I) (CGPA Pattern) Examination, 2016 DATA STRUCTURES USING 'C'

Day and Date: Thursday, 22-12-2016

Time: 10.00 a.m. to 1.00 p.m.

SECTION - I

### 2. Attempt any four questions:

 $(4 \times 3 = 12)$ 

Marks: 56

- 1) What is stack? Write an algorithm of push operation of stack.
- 2) Write a note on Priority Queue.
- 3) Write a 'C' program to find the GCD of two numbers with recursive functions.
- 4) Define the function to check overflow and underflow condition of queue.
- 5) Explain doubly linked list with neat diagram.

### 3. Attempt **any one** question:

8

- 1) Write the algorithm to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A+B  $^{\land}$  D)/(E F) + G.
- 2) Explain singly linked list and write algorithm for following operation
  - a) Insert at specified location
  - b) Delete at end
  - c) Display list elements.

#### 4. Attempt the question:

8

Write a program to implement stack using array, with following functions:emptystack, fullstack, push, pop, display.



5. Attempt any four questions:

 $(4 \times 3 = 12)$ 

- 1) How to represent a graph using adjacency list?
- 2) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.

14, 33, 27, 10, 35, 19, 42, 44

- 3) Define Hashing. Explain following hash function with example.
  - a) Truncation
- b) Mid-square method.
- 4) Create a binary search tree from the following keys

50, 30, 60, 38, 35, 55, 22, 59, 94, 13, 98

- 5) Compare Binary Search with linear search.
- 6. Solve any one question:

8

1) Explain quick sort. Sort the following sequence in ascending order using quick sort.

48, 44, 19, 59, 72, 80, 42, 65, 82, 8, 95, 68

- 2) What do you mean by hashing? Explain different open addressing techniques to resolve collision in detail by giving suitable examples.
- 7. Explain graph traversal methods with examples.

8

deletions are needed

## **SLR-EP - 129**

Sea No				Set	R
	S.E. (E &	TC) (Part – I) (CC DATA STRUC	GPA Pattern) Exa CTURES USING	•	
•	and Date : Thursee : 10.00 a.m. to	•		Max. Mark	s: 70
	Instructions:	minutes in Ansone mark. 2) Answer MCQ/C	wer Book Page No. Objective type ques	Id be solved in first 3 3. Each question carrie stions on Page No. 3 o (P/Q/R/S) on Top of Pa	es nly.
		MCQ/Objecti	ve Type Questions	5	
Dura	ation : 30 Minutes	-		Mark	s:14
1.	Choose the corre	ect answer :		(14×	1=14)
	1) The end from a) Front	which an element g b) Rear	ets removed from t c) Top	he queue is called d) Bottom	

2)is the application of stack.				
Í	<ul><li>a) Execution of sub program</li><li>c) Both a), b)</li></ul>		<ul><li>b) Conversion of the a</li></ul>	•
3)	Queue follows a) FIFO	algorithm b) LIFO	c) RANDOM	d) LILO
4)	A hash function insert keys 55	n f defined as f(key) ,58,68,91,27,145. V	= key mod13, with lin Vhat will be the location	ear probing is used to on of 79 ?
	a) 1	b) 2	c) 3	d) 5
5)	a) must use	a sorted array	tation of binary searces tation of binary searces	ch algorithm ? a lot of insertion and

1500 6) If the given input array is sorted or nearly sorted, which of the following

d) binary search algorithm is not efficient when the data elements more than

algorithm gives the best performance?

c) there must be a mechanism to access middle element directly

- a) Insertion sort b) Selection sort c) Quick sort d) Merge sort



partitioning is balanced or unbalanced								ne
If the inorder and preorder traversal of and A, B, D, E, F, G, H, C respective tree is	a b	inary hen	y tre the	e are post	e D, B order	s, F, trav	E, G, H, A, /ersal of th	
a) D, F, G, A, B, C, H, E c) C, G, H, F, E, D, B, A	d)	г, н D, F	i, D, <sup>=</sup> , H,	G, E	Ξ, Β, ( Ξ, Β, (	Ј, А С, А	<b>.</b>	
<ul><li>a) trees are not connected</li><li>b) graphs may have loops</li><li>c) trees have root</li></ul>			sal, b	oeca	use			
A binary search tree in which the node order:	es I	nave	bee	en ins	serte	d in t	the followir	ng
25,15,35,10,20,30,40. Which of the f traversal of the original tree? a) 10 15 20 30 35 40 25 c) 10 15 20 25 30 35 40	b)	25	- 15 1	10 2	0 35	30	40	er
In linked lists there are no NULL links a) Singly Linked List c) Circular Linked List	b)		•					
Recursively the fib(5) is a) 2 b) 3	c)	5			ď	8 (		
· ·	/							
<ul><li>a) Placing an element at the front end</li><li>b) Placing an element at the top</li></ul>	k							
	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort If the inorder and preorder traversal of and A, B, D, E, F, G, H, C respective tree is a) D, F, G, A, B, C, H, E c) C, G, H, F, E, D, B, A  Graph traversal is different from a tree a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of A binary search tree in which the nod order:  25,15,35,10,20,30,40. Which of the fit traversal of the original tree? a) 10 15 20 30 35 40 25 c) 10 15 20 25 30 35 40  In linked lists there are no NULL links a) Singly Linked List c) Circular Linked List Recursively the fib(5) is a) 2 b) 3  Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory dynamically Adding an element to the stack means a) Placing an element at the front end b) Placing an element at the rear end c) Placing an element at the rear end	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c)  If the inorder and preorder traversal of a band A, B, D, E, F, G, H, C respectively to tree is a) D, F, G, A, B, C, H, E b) c) C, G, H, F, E, D, B, A d)  Graph traversal is different from a tree trae tree at trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of grae A binary search tree in which the nodes I order:  25,15,35,10,20,30,40. Which of the follow traversal of the original tree? a) 10 15 20 30 35 40 25 b) c) 10 15 20 25 30 35 40  In linked lists there are no NULL links in a) Singly Linked List c) Circular Linked List d)  Recursively the fib(5) is a) 2 b) 3 c)  Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory dynamically  Adding an element to the stack means a) Placing an element at the front end b) Placing an element at the rear end	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c) Quid If the inorder and preorder traversal of a binary and A, B, D, E, F, G, H, C respectively then tree is a) D, F, G, A, B, C, H, E b) F, F c) C, G, H, F, E, D, B, A d) D, F Graph traversal is different from a tree travers a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph A binary search tree in which the nodes have order: 25,15,35,10,20,30,40. Which of the following traversal of the original tree? a) 10 15 20 30 35 40 25 b) 25 c) 10 15 20 25 30 35 40 d) 40 In linked lists there are no NULL links in a) Singly Linked List b) Dou c) Circular Linked List d) Non Recursively the fib(5) is a) 2 b) 3 c) 5 Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory dynamically Adding an element to the stack means a) Placing an element at the front end b) Placing an element at the rear end	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c) Quick s  If the inorder and preorder traversal of a binary tre and A, B, D, E, F, G, H, C respectively then the tree is a) D, F, G, A, B, C, H, E b) F, H, D, c) C, G, H, F, E, D, B, A d) D, F, H,  Graph traversal is different from a tree traversal, the a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph A binary search tree in which the nodes have been order:  25,15,35,10,20,30,40. Which of the following is traversal of the original tree? a) 10 15 20 30 35 40 25 b) 25 15 c) 10 15 20 25 30 35 40 d) 40 35 3  In linked lists there are no NULL links in a) Singly Linked List b) Doubly c) Circular Linked List b) Doubly c) Circular Linked List d) None of Recursively the fib(5) is a) 2 b) 3 c) 5  Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory statically d) To allocate memory statically Placing an element to the stack means a) Placing an element at the front end b) Placing an element at the rear end	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c) Quick sort  If the inorder and preorder traversal of a binary tree are and A, B, D, E, F, G, H, C respectively then the poste tree is a) D, F, G, A, B, C, H, E c) C, G, H, F, E, D, B, A d) D, F, H, D, G, E Graph traversal is different from a tree traversal, beca a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph  A binary search tree in which the nodes have been insorder:  25,15,35,10,20,30,40. Which of the following is the straversal of the original tree? a) 10 15 20 30 35 40 25 b) 25 15 10 2 c) 10 15 20 25 30 35 40 d) 40 35 30 2  In linked lists there are no NULL links in a) Singly Linked List c) Circular Linked List d) None of the attraction of the following is the straversively the fib(5) is a) 2 b) 3 c) 5  Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory dynamically Adding an element to the stack means a) Placing an element at the front end b) Placing an element at the top c) Placing an element at the rear end	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c) Quick sort d) If the inorder and preorder traversal of a binary tree are D, B and A, B, D, E, F, G, H, C respectively then the postorder tree is a) D, F, G, A, B, C, H, E c) C, G, H, F, E, D, B, A d) D, F, H, D, G, E, B, G Graph traversal is different from a tree traversal, because a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph A binary search tree in which the nodes have been inserted order:  25,15,35,10,20,30,40. Which of the following is the result traversal of the original tree? a) 10 15 20 30 35 40 25 b) 25 15 10 20 35 c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 In linked lists there are no NULL links in a) Singly Linked List b) Doubly Linked List c) Circular Linked List d) None of the above Recursively the fib(5) is a) 2 b) 3 c) 5 d) Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory dynamically Adding an element to the stack means a) Placing an element at the front end b) Placing an element at the rear end	partitioning is balanced or unbalanced a) Insertion sort b) Selection sort c) Quick sort d) Me If the inorder and preorder traversal of a binary tree are D, B, F, and A, B, D, E, F, G, H, C respectively then the postorder traverse is a) D, F, G, A, B, C, H, E b) F, H, D, G, E, B, C, A c) C, G, H, F, E, D, B, A d) D, F, H, G, E, B, C, A Graph traversal is different from a tree traversal, because a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph A binary search tree in which the nodes have been inserted in order:  25,15,35,10,20,30,40. Which of the following is the result of traversal of the original tree? a) 10 15 20 30 35 40 25 b) 25 15 10 20 35 30 c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 In linked lists there are no NULL links in a) Singly Linked List b) Doubly Linked List c) Circular Linked List d) None of the above Recursively the fib(5) is a) 2 b) 3 c) 5 d) 8 Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory dynamically Adding an element to the stack means a) Placing an element at the front end b) Placing an element at the top c) Placing an element at the rear end	a) Insertion sort b) Selection sort c) Quick sort d) Merge sort If the inorder and preorder traversal of a binary tree are D, B, F, E, G, H, A, and A, B, D, E, F, G, H, C respectively then the postorder traversal of the tree is a) D, F, G, A, B, C, H, E b) F, H, D, G, E, B, C, A c) C, G, H, F, E, D, B, A d) D, F, H, G, E, B, C, A Graph traversal is different from a tree traversal, because a) trees are not connected b) graphs may have loops c) trees have root d) None is true as tree is a subset of graph A binary search tree in which the nodes have been inserted in the following order:  25,15,35,10,20,30,40. Which of the following is the result of a post ord traversal of the original tree? a) 10 15 20 30 35 40 25 b) 25 15 10 20 35 30 40 c) 10 15 20 25 30 35 40 d) 40 35 30 25 20 15 10 In linked lists there are no NULL links in a) Singly Linked List b) Doubly Linked List c) Circular Linked List d) None of the above Recursively the fib(5) is a) 2 b) 3 c) 5 d) 8 Malloc () function is used to a) To deallocate memory dynamically b) To allocate memory statically c) To deallocate memory statically d) To allocate memory statically d) To allocate memory statically d) Placing an element at the front end b) Placing an element at the rear end



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## S.E. (E & TC) (Part – I) (CGPA Pattern) Examination, 2016 DATA STRUCTURES USING 'C'

Day and Date: Thursday, 22-12-2016

Time: 10.00 a.m. to 1.00 p.m.

SECTION-I

#### 2. Attempt any four questions:

 $(4 \times 3 = 12)$ 

Marks: 56

- 1) What is stack? Write an algorithm of push operation of stack.
- 2) Write a note on Priority Queue.
- 3) Write a 'C' program to find the GCD of two numbers with recursive functions.
- 4) Define the function to check overflow and underflow condition of queue.
- 5) Explain doubly linked list with neat diagram.

### 3. Attempt any one question:

8

- 1) Write the algorithm to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A+B  $^{\land}$  D)/(E F) + G.
- 2) Explain singly linked list and write algorithm for following operation
  - a) Insert at specified location
  - b) Delete at end
  - c) Display list elements.

#### 4. Attempt the question:

8

Write a program to implement stack using array, with following functions:emptystack, fullstack, push, pop, display.



5. Attempt any four questions:

 $(4 \times 3 = 12)$ 

- 1) How to represent a graph using adjacency list?
- 2) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.

14, 33, 27, 10, 35, 19, 42, 44

- 3) Define Hashing. Explain following hash function with example.
  - a) Truncation
- b) Mid-square method.
- 4) Create a binary search tree from the following keys

50, 30, 60, 38, 35, 55, 22, 59, 94, 13, 98

- 5) Compare Binary Search with linear search.
- 6. Solve any one question:

8

1) Explain quick sort. Sort the following sequence in ascending order using quick sort.

48, 44, 19, 59, 72, 80, 42, 65, 82, 8, 95, 68

- 2) What do you mean by hashing? Explain different open addressing techniques to resolve collision in detail by giving suitable examples.
- 7. Explain graph traversal methods with examples.

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### S.E. (E & TC) (Part – I) (CGPA Pattern) Examination, 2016 DATA STRUCTURES USING 'C'

Day and Date: Thursday, 22-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

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

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

**Duration: 30 Minutes** Marks: 14

1. Choose the correct answer:

 $(14 \times 1 = 14)$ 

- 1) If the given input array is sorted or nearly sorted, which of the following algorithm gives the best performance?
  - a) Insertion sort
- b) Selection sort c) Quick sort
- d) Merge sort
- 2) The running time of the following sorting algorithm depends on whether the partitioning is balanced or unbalanced
  - a) Insertion sort
- b) Selection sort c) Quick sort
- d) Merge sort
- 3) If the inorder and preorder traversal of a binary tree are D, B, F, E, G, H, A, C and A, B, D, E, F, G, H, C respectively then the postorder traversal of that tree is
  - a) D, F, G, A, B, C, H, E
- b) F, H, D, G, E, B, C, A
- c) C, G, H, F, E, D, B, A
- d) D, F, H, G, E, B, C, A
- 4) Graph traversal is different from a tree traversal, because
  - a) trees are not connected
  - b) graphs may have loops
  - c) trees have root
  - d) None is true as tree is a subset of graph
- 5) A binary search tree in which the nodes have been inserted in the following order:

25,15,35,10,20,30,40. Which of the following is the result of a post order traversal of the original tree?

- a) 10 15 20 30 35 40 25
- b) 25 15 10 20 35 30 40
- c) 10 15 20 25 30 35 40
- d) 40 35 30 25 20 15 10

P.T.O.

6)	In linked lists there are no NULL links a) Singly Linked List c) Circular Linked List	b)	Doubly Linked I None of the abo		
7)	Recursively the fib(5) is a) 2 b) 3	c)	5	d)	8
8)	Malloc () function is used to a) To deallocate memory dynamicall b) To allocate memory statically c) To deallocate memory statically d) To allocate memory dynamically	ly			
9)	Adding an element to the stack mean a) Placing an element at the front en b) Placing an element at the top c) Placing an element at the rear end d) None of the above	d			
10)	The end from which an element gets a) Front b) Rear		oved from the qu Top		e is called Bottom
11)	a) Execution of sub program c) Both a), b)	b)	Conversion of i		to postfix
12)	Queue follows algorithm a) FIFO b) LIFO	c)	RANDOM	d)	LILO
13)	A hash function f defined as $f(key) = ke$ insert keys 55,58,68,91,27,145. Wha a) 1 b) 2	•	l be the location	•	79 ?
14)	<ul> <li>Which of the following is not a limitati</li> <li>a) must use a sorted array</li> <li>b) requirement of sorted array is edeletions are needed</li> <li>c) there must be a mechanism to ac</li> <li>d) binary search algorithm is not efficient</li> <li>1500</li> </ul>	expe	nsive when a los middle elemen	ot d	of insertion and



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## S.E. (E & TC) (Part – I) (CGPA Pattern) Examination, 2016 DATA STRUCTURES USING 'C'

Day and Date: Thursday, 22-12-2016

Time: 10.00 a.m. to 1.00 p.m.

SECTION - I

### 2. Attempt any four questions:

 $(4 \times 3 = 12)$ 

Marks: 56

- 1) What is stack? Write an algorithm of push operation of stack.
- 2) Write a note on Priority Queue.
- 3) Write a 'C' program to find the GCD of two numbers with recursive functions.
- 4) Define the function to check overflow and underflow condition of queue.
- 5) Explain doubly linked list with neat diagram.

#### 3. Attempt any one question:

8

- 1) Write the algorithm to convert infix expression to postfix expression. Convert the following infix expression into postfix expression. (A+B  $^{\land}$  D)/(E F) + G.
- 2) Explain singly linked list and write algorithm for following operation
  - a) Insert at specified location
  - b) Delete at end
  - c) Display list elements.

#### 4. Attempt the question:

8

Write a program to implement stack using array, with following functions:emptystack, fullstack, push, pop, display.



5. Attempt any four questions:

 $(4 \times 3 = 12)$ 

- 1) How to represent a graph using adjacency list?
- 2) Explain insertion sort. Sort the following sequence in ascending order using insertion sort.

14, 33, 27, 10, 35, 19, 42, 44

- 3) Define Hashing. Explain following hash function with example.
  - a) Truncation
- b) Mid-square method.
- 4) Create a binary search tree from the following keys

50, 30, 60, 38, 35, 55, 22, 59, 94, 13, 98

- 5) Compare Binary Search with linear search.
- 6. Solve any one question:

8

1) Explain quick sort. Sort the following sequence in ascending order using quick sort.

48, 44, 19, 59, 72, 80, 42, 65, 82, 8, 95, 68

- 2) What do you mean by hashing? Explain different open addressing techniques to resolve collision in detail by giving suitable examples.
- 7. Explain graph traversal methods with examples.

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## S.E. (E & TC) (CGPA) (Part - II) Examination, 2016 **ELECTRONIC CIRCUIT ANALYSIS & DESIGN - II**

Day and Date : Monday, 21-11-2016	Total Marks: 70
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Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Figures to the **right** indicates **full** marks

	,	•	ole data <b>wherever</b> require	
Duration	n : 30 Minutes	MCQ/Obje	ctive Type Questions	Marks : 14
1. Cho	oose the correct alte	ernative :		(14×1=14)
1)	The gain of an am	plifier is expre	ssed in db because	
	a) it is a simple ur	nit		
	b) human ear resp	onse is good	for logarithmic scale	
	c) calculations be	come easy		
	d) none of the abo	ove		
2)	Which one of the fe	ollowing is mo	st suitable for generating	100Hz signal ?
	a) Hartley oscillate	or	b) Copitts oscilla	tor
	c) Wein bridge os	cillator	d) Crystal oscilla	itor
3)	•	what should b	able capacitor with lower e the value of fixed resista lz ?	• • • • • • • • • • • • • • • • • • • •
	a) 16.92 K $\Omega$		b) 20.92 K $\Omega$	
	c) 30.92 K $\Omega$		d) None of the a	bove
4)	coupl	ing is general	ly employed in power am	plifiers.
	a) Transformer	b) RC	c) Direct	d) Impedance
5)	If a transistor is open input signal, then		a way that output current operation.	flows for 60° of the
	a) class A		b) class B	
	c) class C		d) none of the at	oove



6)	) When emitter bypass capacitor is removed from RC coupled amplifier circuit it results to					
	a) voltage series negative feedback	b) voltage shunt ne	egative feedback			
	c) current series negative feedback	d) current shunt ne	egative feedback			
7)	If the power rating of a transistor is 1 N maximum allowable collector voltage is	N and collector curr	rent is 100 mA, then			
	a) 1 V b) 100 V	c) 20 V	d) 10 V			
8)	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 regulato	or			
	c) As a current regulator and a power s	witch				
	d) As a current regulator alone					
9)	Pre regulator in voltage regulator acts as	S				
	a) Reference voltage source	b) Constant curren	t source			
	c) Pre amplifier	d) All above				
10)	The reference voltage and dropout vorespectively are	oltage for fixed vol	tage regulator 7812			
	a) 2V, 9V b) 14V, 2V	c) 12V, 2V	d) 9V, 9V			
1)	Schmitt Trigger acts as an	nultivibrator.				
	a) Astable b) Monostable	c) Bistable	d) None			
12)	It is required to stretch a $5\mu$ sec pulse to to be used for this is	duration of 5msec. A	An appropriate circuit			
	a) Monostable Multivibrator	b) Astable Multivib	rator			
	c) Schmitt Trigger	d) Bistable Multivik	orator			
13)	The Pin no. 1, 2, 3 for LM-337 are	respectively				
	a) Vin, Vout, ladj b) ladj, Vin, Vout	c) ladj, Vout, Vin	d) Vin, ladj, Vout			
4)	In a transistorized monostable multivibra	ator, quasi stable du	ration is			
	a) 0.7RC b) 1.7RC	c) 1.4RC	d) none			



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## S.E. (E & TC) (CGPA) (Part – II) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date: Monday, 21-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

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

2) Assume suitable data wherever required.

#### SECTION - I

2. Solve any four. (4×4 =16)

a) What is negative feedback? State merits and demerits of negative feedback.

- b) With suitable circuit diagram explain the complementary symmetry power amplifier circuit.
- c) Explain low frequency response of three stage RC coupled amplifier circuit.
- d) For RC phase shift oscillator RL = 3.3 K  $\Omega$ , R = 5.6 K  $\Omega$ , C = 0.01 Mf. Calculate frequency of oscillations and minimum current gain required for sustained oscillations.
- e) An amplifier has a mid band gain of 500, F1 = 50 HZ, F2 = 50 KHZ. If 1% of negative feedback is introduced, calculate gain and bandwidth with feedback.
- 3. Solve the following.

 $(2 \times 6 = 12)$ 

- a) Design RC phase shift oscillator for O/P frequency 5 KHz using transistor. Transistor used is having following specifications -hfe = 150, hie = 2k, VCE max = 45 V, Stability factor = 3, VBE = 0.6V.
- b) Draw circuit diagram of two stage RC coupled amplifier and calculate Ri, Ro, Ai, Av. What is the effect of source resistance on these parameters?

OR

b) List the limitations of single ended class A power amplifier. With suitable circuit diagram explain push pull class A power amplifier.



4. Answer any four. (4×4=16)

- a) Design adjustable voltage regulator for Vo = 5 to 20V at Io = 1A using LM-337.
- 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) Derive Expression for frequency of oscillation for transistorized Monostable multivibrator.
- e) Explain working of transistorized series voltage regulator with pre-regulator.

## 5. Answer **any two**: (2×6=12)

- a) Explain how schmitt trigger can be used as a bistable multivibrator. What are the different methods of triggering?
- b) Design a circuit to switch the system ON-OFF repeatedly for varying ON/OFF period as follows.
  - i) ON time variation = 1.5 msec to 3.5msec
  - ii) Off Time variation = 1msec to 2 msec

system draws a current of 1 amps from 240 V mains.

Use proper IC – (Use proper IC to drive relay of 12V,  $30 \Omega$ )

c) Design a transistorized series voltage regulator for 24 V at 1.5 A, At Vin = 30 V (Assume necessary data).

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S.E. (E & TC) (CGPA) (Part - II) Examination, 2016 **ELECTRONIC CIRCUIT ANALYSIS & DESIGN - II** 

Day and Date: Monday, 21-11-2016 Total Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever required.

Duration	n : 30 Minutes	MCQ/Objective Ty	pe Questions		Marks: 14
Duranoi	1. 30 Millutes				IVIAINS. 14
1. Ch	oose the correct alterr	native :			(14×1=14)
1)	A three terminal mon	olithic IC regulator	can be used as		
	a) An adjustable O/l	P voltage regulator	alone		
	b) An adjustable O/I	ovoltage regulator	and current regulato	r	
	c) As a current regu	lator and a power s	witch		
	d) As a current regu	lator alone			
2)	Pre regulator in volta	ge regulator acts as	S		
	a) Reference voltag	e source	b) Constant curren	t source	
	c) Pre amplifier		d) All above		
3)	The reference volta respectively are	ge and dropout vo	oltage for fixed volt	age regulator	7812
	a) 2V, 9V	b) 14V, 2V	c) 12V, 2V	d) 9V, 9V	
4)	Schmitt Trigger acts	as a n	nultivibrator.		
	a) Astable	b) Monostable	c) Bistable	d) None	
5)	It is required to stretc to be used for this is	h a 5 μ sec pulse to	duration of 5msec. A	An appropriate	circuit
	a) Monostable Multi	vibrator	b) Astable Multivib	rator	
	c) Schmitt Trigger		d) Bistable Multivib	orator	



6)	The Pin no. 1, 2, 3 fe	or LM-337 are		respectively		
	a) Vin, Vout, ladj	b) Iadj, Vin, Vout	c)	ladj, Vout, Vin	d)	Vin, ladj, Vout
7)	In a transistorized m	nonostable multivibr	atoı	r, quasi stable du	ratio	on is
	a) 0.7RC	b) 1.7RC	c)	1.4RC	d)	none
8)	The gain of an amp	lifier is expressed in	db	because		
	a) it is a simple unit	t				
	b) human ear respo	onse is good for loga	arith	nmic scale		
	c) calculations bec	ome easy				
	d) none of the above	/e				
9)	Which one of the fo	llowing is most suita	ble	for generating 1	00H	z signal ?
	a) Hartley oscillato	r	b)	Copitts oscillate	r	
	c) Wein bridge osc	illator	d)	Crystal oscillato	r	
10)	For Wein bridge ose		•			
	limit 470 pF is used v upper frequency lim		aiue	on lixed resistant	se re	equired to provide
	a) 16.92 K $\Omega$		b)	20.92 K $\Omega$		
	c) 30.92 K $\Omega$		d)	None of the abo	ove	
11)	couplir	ng is generally emp	loye	ed in power amp	ifier	s.
	a) Transformer	b) RC	c)	Direct	d)	Impedance
12)	If a transistor is open input signal, then it	_		•	ows	for 60° of the
	a) class A		b)	class B		
	c) class C		d)	none of the abo	ve	
13)	When emitter bypas results to	ss capacitor is remo	ove	d from RC coup	led a	amplifier circuit it
	a) voltage series ne	egative feedback	b)	voltage shunt n	egat	tive feedback
	c) current series ne	gative feedback	d)	current shunt ne	egat	ive feedback
14)	If the power rating maximum allowable			and collector cur	rent	is 100 mA, then
	a) 1 V	b) 100 V	c)	20 V	d)	10 V



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## S.E. (E & TC) (CGPA) (Part – II) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date: Monday, 21-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

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

2) Assume suitable data wherever required.

#### SECTION - I

2. Solve any four. (4×4 =16)

- a) What is negative feedback? State merits and demerits of negative feedback.
- b) With suitable circuit diagram explain the complementary symmetry power amplifier circuit.
- c) Explain low frequency response of three stage RC coupled amplifier circuit.
- d) For RC phase shift oscillator RL = 3.3 K $\Omega$ , R = 5.6 K $\Omega$ , C = 0.01 Mf. Calculate frequency of oscillations and minimum current gain required for sustained oscillations.
- e) An amplifier has a mid band gain of 500, F1 = 50 HZ, F2 = 50 KHZ. If 1% of negative feedback is introduced, calculate gain and bandwidth with feedback.
- 3. Solve the following.

 $(2 \times 6 = 12)$ 

- a) Design RC phase shift oscillator for O/P frequency 5 KHz using transistor. Transistor used is having following specifications -hfe = 150, hie = 2k, VCE max = 45 V, Stability factor = 3, VBE = 0.6V.
- b) Draw circuit diagram of two stage RC coupled amplifier and calculate Ri, Ro, Ai, Av. What is the effect of source resistance on these parameters?

OF

b) List the limitations of single ended class A power amplifier. With suitable circuit diagram explain push pull class A power amplifier.



4. Answer any four. (4×4=16)

- a) Design adjustable voltage regulator for Vo = 5 to 20V at Io = 1A using LM-337.
- 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) Derive Expression for frequency of oscillation for transistorized Monostable multivibrator.
- e) Explain working of transistorized series voltage regulator with pre-regulator.

## 5. Answer any two : (2×6=12)

- a) Explain how schmitt trigger can be used as a bistable multivibrator. What are the different methods of triggering?
- b) Design a circuit to switch the system ON-OFF repeatedly for varying ON/OFF period as follows.
  - i) ON time variation = 1.5 msec to 3.5msec
  - ii) Off Time variation = 1msec to 2 msec

system draws a current of 1 amps from 240 V mains.

Use proper IC – (Use proper IC to drive relay of 12V,  $30 \Omega$ )

c) Design a transistorized series voltage regulator for 24 V at 1.5 A, At Vin = 30 V (Assume necessary data).

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## S.E. (E & TC) (CGPA) (Part – II) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date : Monday, 21-11-2016	Total Marks : 70
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Time: 3.00 p.m. to 6.00 p.m.

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

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

	3) Fig	n't forget to ment ures to the right in sume suitable data	ndica	ates <b>full</b> marks.	•	of Page.
Duration : 3		MCQ/Objective T	ype	Questions		Marks: 14
1. Choos	se the correct alterna	ative :				(14×1=14)
	a transistor is operat gnal, then it is			output current flov	vs for 60° of t	he input
a)	class A		b)	class B		
c)	class C		d)	none of the abov	ve	
,	hen emitter bypass sults to	capacitor is remo	oved	I from RC couple	ed amplifier (	circuit it
a)	voltage series neg	ative feedback	b)	voltage shunt ne	egative feedb	ack
c)	current series neg	ative feedback	d)	current shunt ne	gative feedb	ack
,	the power rating of aximum allowable o			nd collector curr	ent is 100 m	A, then
a)	1 V	o) 100 V	c)	20 V	d) 10 V	
4) A	three terminal mond	olithic IC regulator	can	be used as		
a)	An adjustable O/P	voltage regulator	alo	ne		
b)	An adjustable O/P	voltage regulator	and	current regulato	r	
c)	As a current regula	ator and a power s	switc	ch		
d)	As a current regula	ator alone				
•	e regulator in voltag		ıs			
,	Reference voltage			Constant curren	t source	
,	Pre amplifier		d)	All above		



6)	The reference vol respectively are	tage and dropout	voltage for fixed	voltage regulator 7812
	a) 2V, 9V	b) 14V, 2V	c) 12V, 2V	d) 9V, 9V
7)	Schmitt Trigger act	ts as a	multivibrator.	
	a) Astable	b) Monostable	c) Bistable	d) None
8)	It is required to stre to be used for this	•	o duration of 5ms	ec. An appropriate circuit
	a) Monostable Mu	Iltivibrator	b) Astable Mul	ltivibrator
	c) Schmitt Trigger		d) Bistable Mu	ıltivibrator
9)	The Pin no. 1, 2, 3	for LM-337 are	respecti	vely.
	a) Vin, Vout, ladj	b) Iadj, Vin, Vout	c) ladj, Vout, V	/in d) Vin, ladj, Vout
10)	In a transistorized	monostable multivib	rator, quasi stabl	e duration is
	a) 0.7RC	b) 1.7RC	c) 1.4RC	d) none
11)	The gain of an am	plifier is expressed in	n db because	
	a) it is a simple ur	nit		
	b) human ear resp	oonse is good for log	garithmic scale	
	c) calculations be	come easy		
	d) none of the abo			
12)		ollowing is most suit	_	
	a) Hartley oscillate		b) Copitts osci	
4.0\	,	cillator	, ,	
13)		what should be the v	•	er limit 47 pF and upper stance required to provide
	a) 16.92 K $\Omega$		b) 20.92 K $\Omega$	
	c) 30.92 K $\Omega$		d) None of the	above
14)	coup	ling is generally emp	oloyed in power a	amplifiers.
	a) Transformer	b) RC	c) Direct	d) Impedance



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## S.E. (E & TC) (CGPA) (Part – II) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date: Monday, 21-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

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

2) Assume suitable data wherever required.

#### SECTION - I

2. Solve any four. (4×4 =16)

- a) What is negative feedback? State merits and demerits of negative feedback.
- b) With suitable circuit diagram explain the complementary symmetry power amplifier circuit.
- c) Explain low frequency response of three stage RC coupled amplifier circuit.
- d) For RC phase shift oscillator RL = 3.3 K  $\Omega$ , R = 5.6 K  $\Omega$ , C = 0.01 Mf. Calculate frequency of oscillations and minimum current gain required for sustained oscillations.
- e) An amplifier has a mid band gain of 500, F1 = 50 HZ, F2 = 50 KHZ. If 1% of negative feedback is introduced, calculate gain and bandwidth with feedback.
- 3. Solve the following.

 $(2 \times 6 = 12)$ 

- a) Design RC phase shift oscillator for O/P frequency 5 KHz using transistor. Transistor used is having following specifications -hfe = 150, hie = 2k, VCE max = 45 V, Stability factor = 3, VBE = 0.6 V.
- b) Draw circuit diagram of two stage RC coupled amplifier and calculate Ri, Ro, Ai, Av. What is the effect of source resistance on these parameters?

OF

b) List the limitations of single ended class A power amplifier. With suitable circuit diagram explain push pull class A power amplifier.



4. Answer any four. (4×4=16)

- a) Design adjustable voltage regulator for Vo = 5 to 20V at Io = 1A using LM-337.
- 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) Derive Expression for frequency of oscillation for transistorized Monostable multivibrator.
- e) Explain working of transistorized series voltage regulator with pre-regulator.

## 5. Answer **any two**: (2×6=12)

- a) Explain how schmitt trigger can be used as a bistable multivibrator. What are the different methods of triggering?
- b) Design a circuit to switch the system ON-OFF repeatedly for varying ON/OFF period as follows.
  - i) ON time variation = 1.5 msec to 3.5msec
  - ii) Off Time variation = 1msec to 2 msec

system draws a current of 1 amps from 240 V mains.

Use proper IC – (Use proper IC to drive relay of 12V,  $30 \Omega$ )

c) Design a transistorized series voltage regulator for 24 V at 1.5 A, At Vin = 30 V (Assume necessary data).

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## S.E. (E & TC) (CGPA) (Part – II) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date: Monday, 21-11-2016	Total Marks : 70
<i>y</i>	

Time: 3.00 p.m. to 6.00 p.m.

d) none of the above

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data wherever required.

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Dur	atior	n : 30 Minutes	MCQ/Objective T	ype Questions	Marks:	14
1.	Cho	oose the correct alter	native :		(14×1=1	4)
	1)	The reference volta respectively are	age and dropout v	oltage for fixed vo	oltage regulator 7812	
		a) 2V, 9V	b) 14V, 2V	c) 12V, 2V	d) 9V, 9V	
	2)	Schmitt Trigger acts	s as a r	nultivibrator.		
		a) Astable	b) Monostable	c) Bistable	d) None	
	3)	It is required to streto to be used for this is	•	duration of 5msec.	An appropriate circuit	
		a) Monostable Mult	tivibrator	b) Astable Multivi	brator	
		c) Schmitt Trigger		d) Bistable Multiv	ibrator	
	4)	The Pin no. 1, 2, 3 fo	or LM-337 are	respectivel	y.	
	5)	a) Vin, Vout, ladj In a transistorized m	•	,	d) Vin, ladj, Vout uration is	
		a) 0.7RC	b) 1.7RC	c) 1.4RC	d) none	
	6)	The gain of an ampl	,	,	,	
		a) it is a simple unit	t			
		b) human ear respo	onse is good for loga	arithmic scale		
		c) calculations beco	ome easy			

-2-



7)	Which one of the following is most suita	ble for generating 100Hz signal ?
	a) Hartley oscillator	b) Copitts oscillator
	c) Wein bridge oscillator	d) Crystal oscillator
8)		spacitor with lower limit 47 pF and upper alue of fixed resistance required to provide
	a) 16.92 KΩ	b) 20.92 KΩ
	c) 30.92 KΩ	d) None of the above
9)	coupling is generally empl	oyed in power amplifiers.
	a) Transformer b) RC	c) Direct d) Impedance
10)	If a transistor is operated in such a way tinput signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal, then it is operated in such a way to signal operated in such a	
	a) class A	b) class B
	c) class C	d) none of the above
11)	When emitter bypass capacitor is remoresults to	oved from RC coupled amplifier circuit it
	a) voltage series negative feedback	b) voltage shunt negative feedback
	c) current series negative feedback	d) current shunt negative feedback
12)	If the power rating of a transistor is 1 \ maximum allowable collector voltage is	W and collector current is 100 mA, then
	a) 1 V b) 100 V	c) 20 V d) 10 V
13)	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 s	switch
	d) As a current regulator alone	
14)	Pre regulator in voltage regulator acts as	s
	a) Reference voltage source	b) Constant current source
	c) Pre amplifier	d) All above



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## S.E. (E & TC) (CGPA) (Part – II) Examination, 2016 ELECTRONIC CIRCUIT ANALYSIS & DESIGN – II

Day and Date: Monday, 21-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

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

2) Assume suitable data wherever required.

#### SECTION - I

2. Solve any four. (4×4 =16)

- a) What is negative feedback? State merits and demerits of negative feedback.
- b) With suitable circuit diagram explain the complementary symmetry power amplifier circuit.
- c) Explain low frequency response of three stage RC coupled amplifier circuit.
- d) For RC phase shift oscillator RL = 3.3 K $\Omega$ , R = 5.6 K $\Omega$ , C = 0.01 Mf. Calculate frequency of oscillations and minimum current gain required for sustained oscillations.
- e) An amplifier has a mid band gain of 500, F1 = 50 HZ, F2 = 50 KHZ. If 1% of negative feedback is introduced, calculate gain and bandwidth with feedback.
- 3. Solve the following.

 $(2 \times 6 = 12)$ 

- a) Design RC phase shift oscillator for O/P frequency 5 KHz using transistor. Transistor used is having following specifications -hfe = 150, hie = 2k, VCE max = 45 V, Stability factor = 3, VBE = 0.6V.
- b) Draw circuit diagram of two stage RC coupled amplifier and calculate Ri, Ro, Ai, Av. What is the effect of source resistance on these parameters?

OF

b) List the limitations of single ended class A power amplifier. With suitable circuit diagram explain push pull class A power amplifier.



4. Answer any four. (4×4=16)

- a) Design adjustable voltage regulator for Vo = 5 to 20V at Io = 1A using LM-337.
- 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) Derive Expression for frequency of oscillation for transistorized Monostable multivibrator.
- e) Explain working of transistorized series voltage regulator with pre-regulator.

## 5. Answer any two : (2×6=12)

- a) Explain how schmitt trigger can be used as a bistable multivibrator. What are the different methods of triggering?
- b) Design a circuit to switch the system ON-OFF repeatedly for varying ON/OFF period as follows.
  - i) ON time variation = 1.5 msec to 3.5msec
  - ii) Off Time variation = 1msec to 2 msec

system draws a current of 1 amps from 240 V mains.

Use proper IC – (Use proper IC to drive relay of 12V,  $30 \Omega$ )

c) Design a transistorized series voltage regulator for 24 V at 1.5 A, At Vin = 30 V (Assume necessary data).

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## S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Max. Marks: 70 Day and Date: Tuesday, 22-11-2016

Time: 3.00 p.m. to 6.00 p.m.

- Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
  - 3) All questions are compulsory.
  - 4) Assume **suitable** data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 14 1. Choose the correct answer:  $(14 \times 1 = 14)$ 

- 1) In a communication receiver, the noise is most likely to affect the signal
  - a) at the transmitter

b) in the channel

c) in the information source

- d) at the destination
- 2) What is the ratio of modulating power to total power at 100% modulation?
  - a) 1:3
- b) 1:2
- c) 2:3
- d) 3:2
- 3) Vestigial sideband modulation is used for transmission of
  - a) HF point to point communication b) Monaural broadcasting

c) TV broadcasting

- d) Stereo broadcasting
- 4) The image frequency of a superheterodyne receiver
  - a) is created within the receiver itself
  - b) is due to insufficient adjacent channel rejection
  - c) is not rejected by the IF tuned circuits
  - d) is independent of the frequency to which the receiver is tuned
- 5) A carrier is simultaneously modulated by two sine waves with modulation indices of 0.3 and 0.4. If carrier power is 10 kW, then total modulated power will be
  - a) 12.5 kW
- b) 10 kW
- c) 11.25 kW
- d) 10.5 kW

6)	Flicker noise is a) inversely propo	rtional to frequency	/			
	b) directly proporti	onal to frequency				
	c) independent of	frequency				
	d) is constant over	r all frequencies				
7)	Perfect modulation	occurs when				
	a) Vm > Vc	b) Vm < Vc	c)	Vm = Vc	d)	Vm = Vc = 0
8)	In the generation o	f modulated signal	, a <b>·</b>	/aractor diode c	an k	oe used
	a) FM generation of	only	b)	AM generation	only	/
	c) PM generation (	only	d)	Both b) and c)		
9)	In FM sound broad	casting system, the	ma	ximum frequency	/ de	viation is usually
	a) 15 kHz	b) 75 kHz	c)	100 kHz	d)	5.2 MHz
10)	Good selectivity us	ually means		Bandwidth.		
	a) Wide	b) Narrow	c)	Phase	d)	None of these
11)	In FM for a given fr	equency deviation	the	modulation ind	ex١	/aries
	a) inversely as the	modulating freque	enc	/		
	b) directly as the n	nodulating frequen	су			
	c) independent of	the changes in mo	dula	ating signal		
	d) none of the abo	ve				
12)	Ground waves hav	e the following cha	ırac	teristic		
	a) Progress along	the surface of eart	h			
	b) Must be vertica	lly polarized				
	c) Lies down and	dies at some distar	nce	from the antenn	a	
	d) All of the above					
13)	A folded dipole cor	nsists of				
	a) Single element		•	Two elements		
	c) Four elements		d)	Three elements	6	
14)	A busy tone in a te	lephone system ha	as a	frequency of		
	a) Bursty 400 Hz		b)	Continuous 400	) Hz	<u>-</u>
	c) Bursty 133 Hz		d)	Continuous 133	3 Hz	<u> </u>



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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

*Instructions*: 1) All questions are compulsory.

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

#### SECTION - I

### 2. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Draw and explain the basic block diagram of communication system.
- 2) Describe TDM (Time Division Multiplexing) in detail.
- 3) Define Noise temperature and derive its expression.
- 4) When the modulation percentage is 75, an AM transmitter produces 10 kW. How much of this is carrier power? What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place?

#### 3. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
- 2) What are the SSB generation techniques? Explain one in detail.
- 3) List and define the AM receiver characteristics.



## 4. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Differentiate between Narrowband and Wideband FM.
- 2) Briefly write about Space wave propagation.
- 3) What is the need of Pre-emphasis and De-emphasis?
- 4) List and define different tones in telephony.

## 5. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Explain the multiple stage switching used in crossbar switching in detail.
- 2) Explain Armstrong method of FM generation.
- 3) Explain the following:
  - a) Foster Seeley Discriminator.
  - b) Horn Antenna.


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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

- Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
  - 3) All questions are compulsory.
  - 4) Assume suitable data if necessary.

		MCQ/Objective T	ype Questions	
Duration	on : 30 Minutes	•	•	Marks : 14
_	noose the correct ar In the generation of a) FM generation c) PM generation	of modulated signal only		on only
2)	In FM sound broad a) 15 kHz	• •	•	ncy deviation is usually d) 5.2 MHz
3)	Good selectivity us a) Wide	•		. d) None of these
4)	b) directly as the r	e modulating frequence modulating frequen the changes in mo	ency Icy	ndex varies
5)	Ground waves have a) Progress along b) Must be vertical	the surface of ear		
	<ul><li>c) Lies down and</li><li>d) All of the above</li></ul>	dies at some distar	nce from the ante	nna



6)	A folded dipole consists of				
	a) Single element	b) Two elements			
	c) Four elements	d) Three elements	3		
7)	A busy tone in a telephone system ha	s a frequency of			
	a) Bursty 400 Hz	b) Continuous 400	) Hz		
	c) Bursty 133 Hz	d) Continuous 133	3 Hz		
8)	In a communication receiver, the nois	se is most likely to a	affect the signal		
	a) at the transmitter	b) in the channel			
	c) in the information source	d) at the destination			
9)	What is the ratio of modulating power a) 1:3 b) 1:2	to total power at 10 c) 2:3	00% modulation ? d) 3 : 2		
10)	Vestigial sideband modulation is used	d for transmission o	f		
	a) HF point to point communication	•			
	c) TV broadcasting	d) Stereo broadca	sting		
11)	The image frequency of a superheterodyne receiver				
	<ul><li>a) is created within the receiver itself</li><li>b) is due to insufficient adjacent channel rejection</li></ul>				
	c) is not rejected by the IF tuned circ	•			
	d) is independent of the frequency to	which the receiver	is tuned		
12)	A carrier is simultaneously modulated	•			
	indices of 0.3 and 0.4. If carrier powe	r is 10 kW, then tota	al modulated		
	power will be a) 12.5 kW b) 10 kW	c) 11.25 kW	d) 10.5 kW		
12\	Flicker noise is	0) 11.20 KVV	a) 10.0 KW		
13)	a) inversely proportional to frequency	1			
	b) directly proportional to frequency				
	c) independent of frequency				
	d) is constant over all frequencies				
14)	Perfect modulation occurs when				
	a) Vm > Vc b) Vm < Vc	c) Vm = Vc	d) $Vm = Vc = 0$		



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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

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

#### SECTION - I

### 2. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Draw and explain the basic block diagram of communication system.
- 2) Describe TDM (Time Division Multiplexing) in detail.
- 3) Define Noise temperature and derive its expression.
- 4) When the modulation percentage is 75, an AM transmitter produces 10 kW. How much of this is carrier power? What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place?

### 3. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
- 2) What are the SSB generation techniques? Explain one in detail.
- 3) List and define the AM receiver characteristics.



### 4. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Differentiate between Narrowband and Wideband FM.
- 2) Briefly write about Space wave propagation.
- 3) What is the need of Pre-emphasis and De-emphasis?
- 4) List and define different tones in telephony.

### 5. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Explain the multiple stage switching used in crossbar switching in detail.
- 2) Explain Armstrong method of FM generation.
- 3) Explain the following:
  - a) Foster Seeley Discriminator.
  - b) Horn Antenna.

Seat No.	Set	R
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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

- Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
  - 3) All questions are compulsory.
  - 4) Assume **suitable** data if necessary.

### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(14 \times 1 = 14)$ 

- A carrier is simultaneously modulated by two sine waves with modulation indices of 0.3 and 0.4. If carrier power is 10 kW, then total modulated power will be
- a) 12.5 kW
- b) 10 kW
- c) 11.25 kW
- d) 10.5 kW

- 2) Flicker noise is
  - a) inversely proportional to frequency
  - b) directly proportional to frequency
  - c) independent of frequency
  - d) is constant over all frequencies
- 3) Perfect modulation occurs when
  - a) Vm > Vc
- b) Vm < Vc
- c) Vm = Vc
- d) Vm = Vc = 0
- 4) In the generation of modulated signal, a varactor diode can be used
  - a) FM generation only
- b) AM generation only
- c) PM generation only
- d) Both b) and c)
- 5) In FM sound broadcasting system, the maximum frequency deviation is usually
  - a) 15 kHz
- b) 75 kHz
- c) 100 kHz
- d) 5.2 MHz

6)	Good selectivity usually means		Bandwidth.			
	a) Wide b) Narrow	c)	Phase	d)	None of these	
7)	In FM for a given frequency deviation a) inversely as the modulating frequency b) directly as the modulating frequency c) independent of the changes in modulating frequency d) none of the above	enc <sub>i</sub> icy	/	ex v	varies	
8)	<ul> <li>Ground waves have the following change.</li> <li>a) Progress along the surface of earth</li> <li>b) Must be vertically polarized</li> <li>c) Lies down and dies at some distant</li> <li>d) All of the above</li> </ul>	th		ıa		
9)	A folded dipole consists of					
	a) Single element	b)	Two elements			
	c) Four elements	d)	Three elements	6		
10)	A busy tone in a telephone system ha	as a	frequency of			
	a) Bursty 400 Hz	b)	Continuous 400	) Hz	<u>.</u>	
	c) Bursty 133 Hz	d)	Continuous 133	3 Hz	<u>.</u>	
11)	In a communication receiver, the noi a) at the transmitter c) in the information source	b)	s most likely to a in the channel at the destination		ct the signal	
12)	What is the ratio of modulating power a) 1:3 b) 1:2		otal power at 10 2 : 3		modulation ? 3 : 2	
13)	Vestigial sideband modulation is use a) HF point to point communication c) TV broadcasting	b)		dcas	_	
14)	The image frequency of a superheter a) is created within the receiver itsel b) is due to insufficient adjacent char c) is not rejected by the IF tuned cir d) is independent of the frequency to	f nne cuit	l rejection s	is to	uned	



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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

*Instructions*: 1) All questions are compulsory.

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

#### SECTION - I

### 2. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Draw and explain the basic block diagram of communication system.
- 2) Describe TDM (Time Division Multiplexing) in detail.
- 3) Define Noise temperature and derive its expression.
- 4) When the modulation percentage is 75, an AM transmitter produces 10 kW. How much of this is carrier power? What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place?

### 3. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
- 2) What are the SSB generation techniques? Explain one in detail.
- 3) List and define the AM receiver characteristics.



### 4. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Differentiate between Narrowband and Wideband FM.
- 2) Briefly write about Space wave propagation.
- 3) What is the need of Pre-emphasis and De-emphasis?
- 4) List and define different tones in telephony.

### 5. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Explain the multiple stage switching used in crossbar switching in detail.
- 2) Explain Armstrong method of FM generation.
- 3) Explain the following:
  - a) Foster Seeley Discriminator.
  - b) Horn Antenna.

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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

- Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
  - 3) All questions are compulsory.
  - 4) Assume suitable data if necessary.

Du	ration : 30 Minutes	MCQ/Objectiv	e Type Questions		Marks : 14
Dui	adon: 00 Mindles				Marks . 1-
1.	Choose the correct				(14×1=14)
	Good selectivi	ty usually means	Bandwidth		
	a) Wide	b) Narrow	c) Phase	d) None	e of these
	2) In FM for a giv	en frequency deviat	ion the modulation i	ndex varies	}
	a) inversely a	s the modulating free	quency		
	b) directly as t	the modulating frequ	uency		
	c) independer	nt of the changes in r	modulating signal		
	d) none of the	above			
	3) Ground waves	have the following	characteristic		
	•	long the surface of e			
	,	rtically polarized			
	•	• •	stance from the ante	nna	
	d) All of the at				
	•				
	4) A folded dipole				
	a) Single elem		b) Two element		
	c) Four eleme	nts	d) Three eleme	nts	D.T.O.



5)	A busy tone in a telephone system has a frequency of							
	a) Bursty 400 Hz		b)	Continuous 400	) Hz			
	c) Bursty 133 Hz		d)	Continuous 133	B Hz			
6)	In a communication a) at the transmitter c) in the information	•	oise is most likely to affect the signal b) in the channel d) at the destination					
7)	What is the ratio of n a) 1:3	~ .		otal power at 10 2 : 3		modulation? 3:2		
8)	<ul> <li>Vestigial sideband modulation is use</li> <li>a) HF point to point communication</li> <li>c) TV broadcasting</li> </ul>							
9)	The image frequence a) is created within b) is due to insufficion c) is not rejected by d) is independent of	the receiver itself ent adjacent chan the IF tuned circ	nel cuit	rejection s	is tu	uned		
10)	A carrier is simultane indices of 0.3 and 0. power will be a) 12.5 kW	4. If carrier power	is		al m			
11)	Flicker noise is a) inversely proport b) directly proportio		,		ŕ			
	c) independent of fro							
	d) is constant over a							
12)	Perfect modulation of	occurs when						
	a) Vm > Vc	b) Vm < Vc	c)	Vm = Vc	d)	Vm = Vc = 0		
13)	In the generation of a) FM generation or c) PM generation or	nly	b)	varactor diode ca AM generation Both b) and c)				
14)	In FM sound broadca	sting system, the r	nax	kimum frequency	de v	viation is usually		
	a) 15 kHz	b) 75 kHz	c)	100 kHz	d)	5.2 MHz		



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# S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 ANALOG COMMUNICATION

Day and Date: Tuesday, 22-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

*Instructions*: 1) All questions are compulsory.

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

### SECTION-I

### 2. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Draw and explain the basic block diagram of communication system.
- 2) Describe TDM (Time Division Multiplexing) in detail.
- 3) Define Noise temperature and derive its expression.
- 4) When the modulation percentage is 75, an AM transmitter produces 10 kW. How much of this is carrier power? What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place?

### 3. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
- 2) What are the SSB generation techniques? Explain one in detail.
- 3) List and define the AM receiver characteristics.



### 4. Attempt any three:

 $(4 \times 3 = 12)$ 

- 1) Differentiate between Narrowband and Wideband FM.
- 2) Briefly write about Space wave propagation.
- 3) What is the need of Pre-emphasis and De-emphasis?
- 4) List and define different tones in telephony.

### 5. Attempt any two:

 $(8 \times 2 = 16)$ 

- 1) Explain the multiple stage switching used in crossbar switching in detail.
- 2) Explain Armstrong method of FM generation.
- 3) Explain the following:
  - a) Foster Seeley Discriminator.
  - b) Horn Antenna.

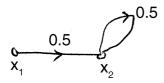
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## S.E. (E&TC) (Part – II) (CGPA) Examination, 2016

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•	d Date : Wednesday 3.00 p.m. to 6.00 p.m		2016		Max. Marks: 70
	2) . 3) .	in Answei <b>Answe</b> r I <b>Don't for</b> <b>Assume</b>	r Book Pag <b>MCQ/Objed</b> <b>get to men</b> suitable da	e No. <b>3. Each</b> qu ctive type quest	-
		MCQ/	Objective 1	Type Questions	
Duratio	n : 30 Minutes				Marks: 14
1. Ch	oose the correct an	swer:			14
<ul><li>1) The viscous friction coefficient, in force</li><li>a) Charge</li><li>c) Reciprocal of inductance</li></ul>		e-voltage analogy, is analogous to b) Resistance d) Reciprocal of conductance			
2)	The type 1 system a) No pole c) Simple pole	has	at	the origin. b) No zero d) Two poles	
3)	of S-plane.				roots in the right half
43	•	•		c) Three	•
4)	a) 0.353			e characteristic e c) 0.300	quation $S^2 + 2S + 8 = 0$ is d) 0.250
5) If the transfer function of a first-order sys			t-order syst	em is $G(S) = \frac{10}{1+2}$	$\frac{1}{2}$ , then the time-constant
	of the system is				
	a) 10 seconds	b) $\frac{1}{10}$	seconds	c) 2 seconds	d) $\frac{1}{2}$ seconds
6)	The steady-state of becomes finite in a		feedback (	control system w	rith an acceleration input
	<ul><li>a) Type 0 system</li><li>c) Type 2 system</li></ul>			b) Type 1 syst d) type 3 syste	

7) The transfer function of the signal flow graph shown below is



a) 1

- b) 9
- c) 8
- d) 12

8) The starting point of root loci are the location of pole when K =

a) 0

- b) 1
- c) ∞
- d) −∝

9) Settling time for 2% tolerance is

- a)  $\frac{4}{\delta w_n}$
- b)  $\frac{3}{\delta w_n}$
- c)  $\frac{2}{\delta w_n}$
- d)  $\frac{1}{\delta w_r}$

10) Lag compensator reduces

a) Bandwidth

b) Rise time

c) Transient response

d) All of the above

11) The phase cross over frequency is the point on frequency axis of the system at which the phase of  $G(j_{\omega})$  is at

- a)  $-90^{\circ}$
- b) -180°
- c)  $-270^{\circ}$
- d) -360°

12) For  $G(S) = \frac{K}{S(S+1)(S+2)(S+3)}$ , the number of asymptotes are

a) 1

- b) 2
- c) 3
- d) 4

13) In I order system, when unit input is applied, the response having maximum value at  $t \to \infty$ .

- a) Zero
- b) Unity
- c) Infinity
- d) None of these

14)  $f(t) = A \cdot \delta(t)$  in this equation 'A' stands for

- a) Function in time domain
- b) Function strength
- c) Deviation in time domain
- d) All of the above

Marks: 56

Seat No.

## S.E. (E&TC) (Part – II) (CGPA) Examination, 2016 CONTROL SYSTEMS

Day and Date: Wednesday, 23-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data wherever necessary.

2) Figures to the **right** indicate **full** marks.

#### SECTION - I

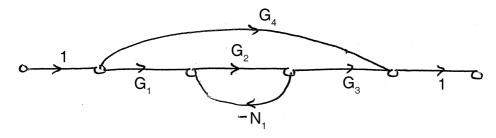
2. Solve any four: (4×4=16)

a) Explain with neat diagram liquid level control system.

- b) Find the transfer function of RLC series circuit.
- c) Classify the control systems.
- d) Explain special cases in Routh's criterion.
- e) Explain the procedure of block diagram reduction technique.
- 3. a) Find the stability of a system having characteristic equation  $S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$ .

b) Solve any one:

i) Find the transfer function of the following signal flow graph.



- ii) Define the following:
  - 1) Path
  - 3) Loop
  - 5) Path gain

- 2) Forward path
- 4) Loop gain
- 6) Non-touching loops.

6



4. Solve any four: (4×4=16)

- a) Derive the response of I order system to unit step input.
- b) Explain lead lag compensator.
- c) In frequency response using Bode plot, the slope 6 db/octave and the slope 20 db/decade are one and the same why?
- d) Explain how centroid and breakaway points are calculated in root locus.
- e) Explain the effect of lead compensator and also give limitations of lead compensator.
- 5. Solve any two: (6×2=12)
  - a) Sketch the root locus for the system:

$$G(S) \cdot H(S) = \frac{K(S+2)}{S(S+3)(S+4)}$$
.

b) Determine the error constant for

G · H = 
$$\frac{64(S+2)}{S(S+0.5)(S^2+3.2S+64)}$$
.

c) Draw the asymptotic Bode plot for feedback control system having

$$G(S) \cdot H(S) = \frac{20}{S\left(1 + \frac{S}{4}\right)\left(1 + \frac{S}{40}\right)}$$
 and comment on stability.


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## Q

	S.E. (E	ڊ Part) (Part) CON	- II) (CGPA) ITROL SYS		ntion, 2016	
•	te : Wednesday o.m. to 6.00 p.m	Max.	Marks : 70			
Insti	i 2) 1 1 3) 1	n Answer Bo <b>Answer MC</b>	ook Page No <b>Q/Objective to mention</b> able data wi	. 3. Each o type ques , Q.P. Set ( herever ne	_	mark. <b>3 only.</b>
Duration : 30	) Minutes	MCQ/Obj	ective Type	Questions		Marks : 14
1. Choose	the correct ans	swer:				14
1) The a)	e starting point o	of root loci ard	e the locatio c)	-	hen K = d) -∞	
2) Set	tling time for $2\%$	tolerance is	3			
a)	$\frac{4}{\delta w_n}$	b) $\frac{3}{\delta w_n}$	c)	$\frac{2}{\delta w_n}$	d) $\frac{1}{\delta w_r}$	
a)	compensator r Bandwidth Transient respo		,	Rise time	above	
whi	phase cross och the phase of -90° -270°	•	b)	nt on freque -180° -360°	ency axis of the syst	em at
5) For	$G(S) = \frac{1}{S(S+1)}$	K (S + 2) (S +	${3)}$ , the num	ber of asyn	nptotes are	
a)	1	b) 2	c)	3	d) 4	
6) In I	order system, w at  t	_	ut is applied,	the respon	se having maximum	value
,	Zero Infinity		,	Unity None of th	ese	



- 7)  $f(t) = A \cdot \delta(t)$  in this equation 'A' stands for
  - a) Function in time domain
- b) Function strength
- c) Deviation in time domain
- d) All of the above
- 8) The viscous friction coefficient, in force-voltage analogy, is analogous to
  - a) Charge

- b) Resistance
- c) Reciprocal of inductance
- d) Reciprocal of conductance
- 9) The type 1 system has \_\_\_\_\_ at the origin.
  - a) No pole

b) No zero

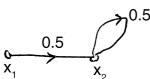
c) Simple pole

- d) Two poles
- 10) The equation  $2S^4 + S^3 + 3S^2 + 5S + 10 = 0$  has \_\_\_\_\_ roots in the right half of S-plane.
  - a) One
- b) Two
- c) Three
- d) Four
- 11) The damping ratio of a system having the characteristic equation  $S^2 + 2S + 8 = 0$  is
  - a) 0.353
- b) 0.330
- c) 0.300
- d) 0.250
- 12) If the transfer function of a first-order system is  $G(S) = \frac{10}{1+2S}$ , then the time-constant of the system is
  - a) 10 seconds
- b)  $\frac{1}{10}$  seconds c) 2 seconds d)  $\frac{1}{2}$  seconds
- 13) The steady-state error of a feedback control system with an acceleration input becomes finite in a
  - a) Type 0 system

b) Type 1 system

c) Type 2 system

- d) type 3 system
- 14) The transfer function of the signal flow graph shown below is



a) 1

- b) 9
- c) 8
- d) 12

Marks: 56

Seat No.

## S.E. (E&TC) (Part – II) (CGPA) Examination, 2016 CONTROL SYSTEMS

Day and Date: Wednesday, 23-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

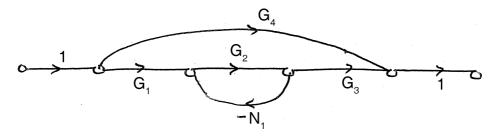
2. Solve any four: (4×4=16)

a) Explain with neat diagram liquid level control system.

- b) Find the transfer function of RLC series circuit.
- c) Classify the control systems.
- d) Explain special cases in Routh's criterion.
- e) Explain the procedure of block diagram reduction technique.
- 3. a) Find the stability of a system having characteristic equation  $S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$ .

b) Solve any one:

i) Find the transfer function of the following signal flow graph.



- ii) Define the following:
  - 1) Path
  - 3) Loop
  - 5) Path gain

- 2) Forward path
- 4) Loop gain
- 6) Non-touching loops.

Set Q

6



- 4. Solve any four: (4×4=16)
  - a) Derive the response of I order system to unit step input.
  - b) Explain lead lag compensator.
  - c) In frequency response using Bode plot, the slope 6 db/octave and the slope 20 db/decade are one and the same why?
  - d) Explain how centroid and breakaway points are calculated in root locus.
  - e) Explain the effect of lead compensator and also give limitations of lead compensator.
- 5. Solve any two: (6×2=12)
  - a) Sketch the root locus for the system:

$$G(S) \cdot H(S) = \frac{K(S+2)}{S(S+3)(S+4)}$$
.

b) Determine the error constant for

G · H = 
$$\frac{64(S+2)}{S(S+0.5)(S^2+3.2S+64)}$$
.

c) Draw the asymptotic Bode plot for feedback control system having

$$G(S) \cdot H(S) = \frac{20}{S\left(1 + \frac{S}{4}\right)\left(1 + \frac{S}{40}\right)}$$
 and comment on stability.


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### S.E. (E&TC) (Part – II) (CGPA) Examination, 2016 **CONTROL SYSTEMS**

Day and Date: Wednesday, 23-11-2016

Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

Instructions:

- 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) **Assume** suitable data **wherever** necessary.
- 4) Figures to the right indicate full marks.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 14

1. Choose the correct answer:

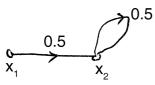
14

- 1) If the transfer function of a first-order system is  $G(S) = \frac{10}{1+2S}$ , then the time-constant of the system is
  - a) 10 seconds
- b)  $\frac{1}{10}$  seconds c) 2 seconds d)  $\frac{1}{2}$  seconds
- 2) The steady-state error of a feedback control system with an acceleration input becomes finite in a
  - a) Type 0 system

b) Type 1 system

c) Type 2 system

- d) type 3 system
- 3) The transfer function of the signal flow graph shown below is



a) 1

- b) 9
- c) 8
- d) 12
- 4) The starting point of root loci are the location of pole when K =

- b) 1
- c) ∞

- 5) Settling time for 2% tolerance is



6)	Lag compensator red	duces						
	a) Bandwidth			b) Rise time				
	c) Transient response			d) All of the above				
7)	The phase cross over frequency is the which the phase of $G(j\omega)$ is at			nt on frequency a	ixis	of the system at		
	a) -90°	• ,	c)	<b>−270</b> °	d)	–360°		
8)	For $G(S) = \frac{1}{S(S+1)}$	$\frac{K}{S+2)(S+3)}$ , the n	um	ber of asymptote	s ar	re		
	a) 1	b) 2	c)	3	d)	4		
9)	In I order system, wh	en unit input is appli	ed,	the response ha	ving	g maximum value		
	$\_$ at t $\rightarrow$	∞.						
	a) Zero	b) Unity	c)	Infinity	d)	None of these		
10)	$f(t) = A \cdot \delta(t)$ in this $\epsilon$	equation 'A' stands f	or					
	a) Function in time	domain	b)	Function strengt	h			
	c) Deviation in time	domain	d)	All of the above				
11)	The viscous friction of	coefficient, in force-			ınal	ogous to		
	a) Charge		,	Resistance				
	c) Reciprocal of ind	uctance	d)	Reciprocal of co	ndı	uctance		
12)	The type 1 system h	as at tl		-				
	a) No pole		,	No zero				
	c) Simple pole		,	Two poles				
13)	The equation $2S^4 + S^4$ of S-plane.	S <sup>3</sup> + 3S <sup>2</sup> + 5S + 10 =	= O I	has	roo	ts in the right half		
	a) One	b) Two	c)	Three	d)	Four		
14)	The damping ratio of	a system having the	ch	aracteristic equat	ion	$S^2 + 2S + 8 = 0$ is		
	a) 0.353	b) 0.330	c)	0.300	d)	0.250		

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Marks: 56

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## S.E. (E&TC) (Part – II) (CGPA) Examination, 2016 CONTROL SYSTEMS

Day and Date: Wednesday, 23-11-2016

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Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

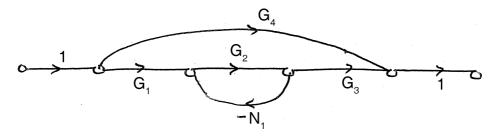
2. Solve any four: (4×4=16)

a) Explain with neat diagram liquid level control system.

- b) Find the transfer function of RLC series circuit.
- c) Classify the control systems.
- d) Explain special cases in Routh's criterion.
- e) Explain the procedure of block diagram reduction technique.
- 3. a) Find the stability of a system having characteristic equation  $S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$ .

b) Solve any one:

i) Find the transfer function of the following signal flow graph.



- ii) Define the following:
  - 1) Path
  - 3) Loop
  - 5) Path gain

- 2) Forward path
- 4) Loop gain
- 6) Non-touching loops.

Set R

6



4. Solve any four: (4×4=16)

- a) Derive the response of I order system to unit step input.
- b) Explain lead lag compensator.
- c) In frequency response using Bode plot, the slope 6 db/octave and the slope 20 db/decade are one and the same why?
- d) Explain how centroid and breakaway points are calculated in root locus.
- e) Explain the effect of lead compensator and also give limitations of lead compensator.
- 5. Solve any two: (6×2=12)
  - a) Sketch the root locus for the system:

$$G(S) \cdot H(S) = \frac{K(S+2)}{S(S+3)(S+4)}$$
.

b) Determine the error constant for

G · H = 
$$\frac{64(S+2)}{S(S+0.5)(S^2+3.2S+64)}$$
.

c) Draw the asymptotic Bode plot for feedback control system having

$$G(S) \cdot H(S) = \frac{20}{S\left(1 + \frac{S}{4}\right)\left(1 + \frac{S}{40}\right)}$$
 and comment on stability.

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	S.E	. (E&TC) (Part – CON	II) (CGPA FROL SYS	-	ation, 2016	
•	d Date : Wedne .00 p.m. to 6.00	sday, 23-11-2016 ) p.m.			Max. Mark	(s:70
1	Instructions :	in Answer Boo 2) <b>Answer MCQ</b>	ok Page No N <b>Objective</b> To mention Ible data w	o. 3. Each e type que , Q.P. Set herever r	•	k. n <b>ly.</b>
Duration	n : 30 Minutes	MCQ/Obje	ctive Type	Questio		ks : 14
1. Cho	oose the correc	t answer :				14
	Lag compensa a) Bandwidth c) Transient r The phase cro	esponse	ď)	Rise time All of the		at
	which the phase a) -90° c) -270°	se of $G(j\omega)$ is at	•	–180° –360°		
3)	For $G(S) = \frac{1}{S(S)}$	K S + 1) (S + 2) (S + 3	_ , the num	ber of asy	mptotes are	
	a) 1	b) 2	c)	3	d) 4	
4)	In I order syste	•	t is applied,	the respo	nse having maximum valu	е
	<ul><li>a) Zero</li><li>c) Infinity</li></ul>			Unity None of t	hese	
5)	a) Function in	n this equation 'A' in time domain not time domain	b)	Function All of the	•	
6)	a) Charge	iction coefficient, in of inductance	b)	Resistan	egy, is analogous to ce al of conductance	



- 7) The type 1 system has \_\_\_\_\_ at the origin.
  - a) No pole

b) No zero

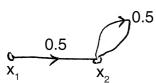
c) Simple pole

- d) Two poles
- 8) The equation  $2S^4 + S^3 + 3S^2 + 5S + 10 = 0$  has \_\_\_\_\_ roots in the right half of S-plane.
  - a) One
- b) Two
- c) Three
- d) Four
- 9) The damping ratio of a system having the characteristic equation  $S^2 + 2S + 8 = 0$  is
  - a) 0.353
- b) 0.330
- c) 0.300
- d) 0.250
- 10) If the transfer function of a first-order system is  $G(S) = \frac{10}{1+2S}$ , then the time-constant of the system is
  - a) 10 seconds
- b)  $\frac{1}{10}$  seconds c) 2 seconds d)  $\frac{1}{2}$  seconds
- 11) The steady-state error of a feedback control system with an acceleration input becomes finite in a
  - a) Type 0 system

b) Type 1 system

c) Type 2 system

- d) type 3 system
- 12) The transfer function of the signal flow graph shown below is



- b) 9
- c) 8
- d) 12
- 13) The starting point of root loci are the location of pole when K =

- c) ∞

- 14) Settling time for 2% tolerance is

Marks: 56

Seat No.

## S.E. (E&TC) (Part – II) (CGPA) Examination, 2016 CONTROL SYSTEMS

Day and Date: Wednesday, 23-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

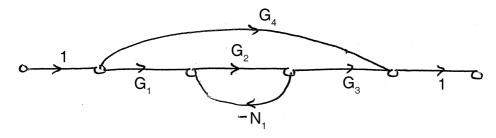
2. Solve any four: (4×4=16)

a) Explain with neat diagram liquid level control system.

- b) Find the transfer function of RLC series circuit.
- c) Classify the control systems.
- d) Explain special cases in Routh's criterion.
- e) Explain the procedure of block diagram reduction technique.
- 3. a) Find the stability of a system having characteristic equation  $S^6 + 2S^5 + 7S^4 + 10S^3 + 14S^2 + 8S + 8 = 0$ .

b) Solve any one:

i) Find the transfer function of the following signal flow graph.



- ii) Define the following:
  - 1) Path
  - 3) Loop
  - 5) Path gain

- 2) Forward path
- 4) Loop gain
- 6) Non-touching loops.

6



4. Solve any four: (4×4=16)

- a) Derive the response of I order system to unit step input.
- b) Explain lead lag compensator.
- c) In frequency response using Bode plot, the slope 6 db/octave and the slope 20 db/decade are one and the same why?
- d) Explain how centroid and breakaway points are calculated in root locus.
- e) Explain the effect of lead compensator and also give limitations of lead compensator.
- 5. Solve any two: (6×2=12)
  - a) Sketch the root locus for the system:

$$G(S) \cdot H(S) = \frac{K(S+2)}{S(S+3)(S+4)}$$
.

b) Determine the error constant for

G · H = 
$$\frac{64(S+2)}{S(S+0.5)(S^2+3.2S+64)}$$
.

c) Draw the asymptotic Bode plot for feedback control system having

$$G(S) \cdot H(S) = \frac{20}{S\left(1 + \frac{S}{4}\right)\left(1 + \frac{S}{40}\right)}$$
 and comment on stability.

Seat	
No.	

Set P

Max. Marks: 70

# S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Figure to the **right** indicates **full** marks.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

- 1)  $Ri_f = Ri(1 + AB)$  represents
  - a) Input resistance of non-inverting amplifier
  - b) Input resistance of inverting amplifier
  - c) Open loop i/p resistance
  - d) None of these
- 2)  $A(R_1 + R_f)/(R_1 + R_f + AR_1)$  represents
  - a) Exact voltage gain of non-inverting amplifier
  - b) Exact voltage gain of inverting amplifier
  - c) Ideal voltage gain of inverting amplifier
  - d) None
- 3) Gain limiting frequency of a differentiator is given by
  - a)  $1/2 \pi R_f C_1$

b)  $1/2\pi R_1C_1$ 

c)  $1/2 \pi R_1 C_f$ 

d)  $1/2\pi R_f C_f$ 

- 4) Slew rate of op-amp is considered for
  - a) AC application

b) DC application

c) Both a) and b)

d) None

5)	What is the value o				
	a) 500 nA	b) 6 mV	c)	90	d) 90 dB
6)	Which of the follow a) Voltage follower c) Current series for		b)	Inverter	der circuit ?
7)	Which of the follow a) DIUO c) Level shifting sta		b)	ciding the gain of DIBO Output stage	ithe op-amp?
8)	Which of the below Op-amp?	application can be	e re	alized in open lo	op configuration of
	a) Schmitt trigger		b)	Peak Detector	
	c) Zero Crossing D	Detector	d)	None	
9)	A duty cycle is	in saw	too	th wave generat	or.
	a) 90%		b)	66%	
	c) Other than 50%		d)	20%	
10)	Analog multiplier ar	e available as			
	a) One quadrant		b)	Two quadrant	
	c) Four quadrant		d)	All of the above	<b>!</b>
11)	IC 8038 is used to g	generate			
	a) Sine wave		b)	Square wave	
	c) Triangular wave		d)	All of the above	<b>!</b>
12)	Schmitt trigger circ	uit is also called a	S		
	a) Square wave ge			Squaring circuit	t
	c) Sine wave gene	rator	d)	None of these	
13)	Butterworth filter is	also known as		filter.	
	a) Flat-flat		,	Ripple-flat	
	c) Flat-ripple		d)	Ripple-ripple	
14)	Which one is sinus	oidal oscillator?			
	a) Wein bridge		•	Phase shift	
	c) Quadrature		d)	All of the above	<del>!</del>



Seat	
No.	

# S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

3) Figure to the **right** indicates **full** marks.

### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

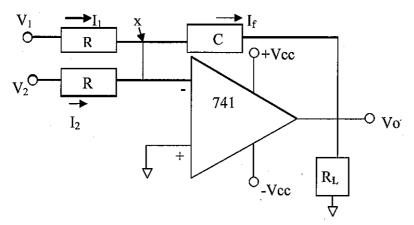
Marks: 56

- a) Design the voltage series feedback amplifier using op-amp IC 741 for the gain between 5 to 10.
- b) Draw and explain frequency response of IC 741.
- c) Explain constant current bias circuit.
- d) Derive output voltage equation for 3 input non-inverting summing amplifier.
- e) Derive open loop voltage gain equation as a function of frequency.

3. Solve any two:

 $(6 \times 2 = 12)$ 

a) Derive output voltage equation for the following circuit and proper name to the circuit.



- b) Explain universal balancing technique.
- c) Compare open loop and closed loop configuration of op-amp. Explain differential amplifier with two op-amp.

Set P

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### SECTION - II

4. Attempt any four of the following:

(4 marks each)

- a) Explain analog multiplier.
- b) Write a short note on Schmitt trigger.
- c) Draw and explain peak detector using op-amp.
- d) Draw and explain 1st order low pass butter-worth filter.
- e) Explain half wave precision rectifier with waveforms.
- 5. Attempt any two of the following:

(6 marks each)

- a) Draw and explain Wein bridge oscillator.
- b) Explain functional diagram of IC 8308.
- c) Draw and explain square wave generator in detail.


Seat		
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# S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

c) Sine wave generator

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Figure to the **right** indicates **full** marks.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

d) None of these

M	ICQ/Objective Type	Questions
Duration : 30 Minutes	-	Marks: 14
1. Choose the correct answ	ver:	(1×14=14)
<ol> <li>Which of the below a Op-amp?</li> </ol>	pplication can be re	alized in open loop configuration of
a) Schmitt trigger	b)	Peak Detector
c) Zero Crossing De	tector d)	None
2) A duty cycle is	in saw too	th wave generator.
a) 90%	b)	66%
c) Other than 50%	d)	20%
3) Analog multiplier are	available as	
a) One quadrant	b)	Two quadrant
c) Four quadrant	d)	All of the above
4) IC 8038 is used to ge	nerate	
a) Sine wave	b)	Square wave
c) Triangular wave	d)	All of the above
5) Schmitt trigger circui	t is also called as	
a) Square wave gene		Squaring circuit

6)	Butterworth filter is also known asa) Flat-flat		filter. Ripple-flat	
	c) Flat-ripple	d)	Ripple-ripple	
7)	Which one is sinusoidal oscillator?  a) Wein bridge c) Quadrature	,	Phase shift All of the above	)
8)	Ri <sub>f</sub> = Ri(1 + AB) represents a) Input resistance of non-inverting a b) Input resistance of inverting amplif c) Open loop i/p resistance d) None of these	•	lifier	
9)	A(R <sub>1</sub> + R <sub>f</sub> )/(R <sub>1</sub> + R <sub>f</sub> + AR <sub>1</sub> ) represent a) Exact voltage gain of non-inverting b) Exact voltage gain of inverting amp c) Ideal voltage gain of inverting amp d) None	g an plifi	er	
10)	Gain limiting frequency of a differential a) $1/2 \pi R_f C_1$ c) $1/2 \pi R_1 C_f$	b)	ris given by 1/2πR <sub>1</sub> C <sub>1</sub> 1/2πR <sub>f</sub> C <sub>f</sub>	
11)	Slew rate of op-amp is considered for a) AC application c) Both a) and b)	b)	DC application None	
12)	What is the value of CMRR of IC741 'a) 500 nA b) 6 mV		90	d) 90 dB
13)	<ul><li>Which of the following circuit is used a</li><li>a) Voltage follower</li><li>c) Current series feedback amplifier</li></ul>	b)	Inverter	der circuit ?
14)	Which of the following is important in (a) DIUO c) Level shifting stage	b)	iding the gain o DIBO Output stage	f the op-amp ?



Seat	
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# S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

3) Figure to the **right** indicates **full** marks.

### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

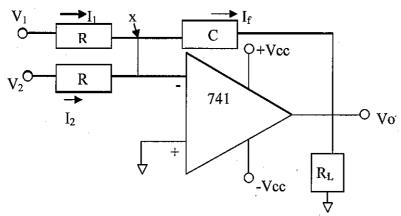
Marks: 56

- a) Design the voltage series feedback amplifier using op-amp IC 741 for the gain between 5 to 10.
- b) Draw and explain frequency response of IC 741.
- c) Explain constant current bias circuit.
- d) Derive output voltage equation for 3 input non-inverting summing amplifier.
- e) Derive open loop voltage gain equation as a function of frequency.

### 3. Solve any two:

 $(6 \times 2 = 12)$ 

a) Derive output voltage equation for the following circuit and proper name to the circuit.



- b) Explain universal balancing technique.
- c) Compare open loop and closed loop configuration of op-amp. Explain differential amplifier with two op-amp.

Set Q

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### SECTION - II

4. Attempt any four of the following:

(4 marks each)

- a) Explain analog multiplier.
- b) Write a short note on Schmitt trigger.
- c) Draw and explain peak detector using op-amp.
- d) Draw and explain 1st order low pass butter-worth filter.
- e) Explain half wave precision rectifier with waveforms.
- 5. Attempt any two of the following:

(6 marks each)

- a) Draw and explain Wein bridge oscillator.
- b) Explain functional diagram of IC 8308.
- c) Draw and explain square wave generator in detail.

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#### **SLR-EP - 133**

No.		Set R
S.E.	. (Electronics and Telecommunic (Part – II) (CGPA) Examinat LINEAR INTEGRATED CII	ion, 2016
Day and Date : Time : 3.00 p.n	Thursday, 24-11-2016 n. to 6.00 p.m.	Max. Marks : 70
Instruc	tions: 1) All questions are compulsory 2) Assume suitable data if neces	

3) Figure to the **right** indicates **full** marks.

one mark.

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

4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries

	Don't forget to m	ention, Q.P. Se	et (P/Q/R/S) on Top of Page	9.
	MCQ/Objective	e Type Questio	ns	
Duration	on : 30 Minutes		Marks:	: 14
1. Ch	noose the correct answer :		(1×14=	:14)
1)	What is the value of CMRR of IC74	41 ?		
	a) 500 nA b) 6 mV	c) 90	d) 90 dB	
2)	<ul><li>Which of the following circuit is use</li><li>a) Voltage follower</li><li>c) Current series feedback amplifi</li></ul>	b) Inverter	tch finder circuit ?	
3)	<ul><li>Which of the following is important</li><li>a) DIUO</li><li>c) Level shifting stage</li></ul>	in deciding the b) DIBO d) Output st		
4)	<ul><li>Which of the below application car</li><li>Op-amp?</li><li>a) Schmitt trigger</li><li>c) Zero Crossing Detector</li></ul>	be realized in o b) Peak De d) None		
5)	A duty cycle is in sa a) 90% c) Other than 50%	aw tooth wave g b) 66% d) 20%	enerator.	

6)	Analog multiplier are available as		
	a) One quadrant	b)	Two quadrant
	c) Four quadrant	d)	All of the above
7)	IC 8038 is used to generate		
,	a) Sine wave	b)	Square wave
	c) Triangular wave	d)	All of the above
8)	Schmitt trigger circuit is also called a	s	
,	a) Square wave generator		Squaring circuit
	c) Sine wave generator		None of these
9)	Butterworth filter is also known as		filter.
,	a) Flat-flat	b)	Ripple-flat
	c) Flat-ripple		Ripple-ripple
10)	Which one is sinusoidal oscillator?		
,	a) Wein bridge	b)	Phase shift
	c) Quadrature	d)	All of the above
11)	$Ri_f = Ri(1 + AB)$ represents		
ĺ	a) Input resistance of non-inverting a	mp	lifier
	b) Input resistance of inverting amplif	fier	
	c) Open loop i/p resistance		
	d) None of these		
12)	$A(R_1 + R_f)/(R_1 + R_f + AR_1)$ represent	S	
	a) Exact voltage gain of non-inverting	g an	nplifier
	b) Exact voltage gain of inverting am	plifi	er
	c) Ideal voltage gain of inverting amp	lifie	er
	d) None		
13)	Gain limiting frequency of a differentia	atoı	r is given by
	a) $1/2\pi R_f C_1$		$1/2\pi R_1C_1$
	c) 1/2πR <sub>1</sub> C <sub>f</sub>	d)	$1/2 \pi R_f C_f$
14)	Slew rate of op-amp is considered for		_
	a) AC application	,	DC application
	c) Both a) and b)	d)	None



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### S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

3) Figure to the **right** indicates **full** marks.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

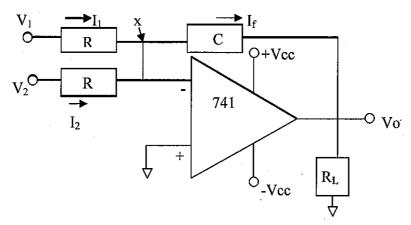
Marks: 56

- a) Design the voltage series feedback amplifier using op-amp IC 741 for the gain between 5 to 10.
- b) Draw and explain frequency response of IC 741.
- c) Explain constant current bias circuit.
- d) Derive output voltage equation for 3 input non-inverting summing amplifier.
- e) Derive open loop voltage gain equation as a function of frequency.

#### 3. Solve any two:

 $(6 \times 2 = 12)$ 

a) Derive output voltage equation for the following circuit and proper name to the circuit.



- b) Explain universal balancing technique.
- c) Compare open loop and closed loop configuration of op-amp. Explain differential amplifier with two op-amp.

Set R

-4-

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#### SECTION - II

4. Attempt any four of the following:

(4 marks each)

- a) Explain analog multiplier.
- b) Write a short note on Schmitt trigger.
- c) Draw and explain peak detector using op-amp.
- d) Draw and explain 1st order low pass butter-worth filter.
- e) Explain half wave precision rectifier with waveforms.
- 5. Attempt any two of the following:

(6 marks each)

- a) Draw and explain Wein bridge oscillator.
- b) Explain functional diagram of IC 8308.
- c) Draw and explain square wave generator in detail.

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No.	Set	S
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#### S.E. (Electronics and Telecommunication Engineering) (Part - II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Figure to the **right** indicates **full** marks.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

MCQ/Objective	Type Questions	
Duration: 30 Minutes	••	Marks: 14
1. Choose the correct answer:		(1×14=14)
1) Analog multiplier are available as		
a) One quadrant	b) Two quadrant	
c) Four quadrant	d) All of the above	
2) IC 8038 is used to generate		
a) Sine wave	b) Square wave	
c) Triangular wave	d) All of the above	
3) Schmitt trigger circuit is also called	as	
a) Square wave generator	b) Squaring circuit	
c) Sine wave generator	d) None of these	
4) Butterworth filter is also known as _	filter.	
a) Flat-flat	b) Ripple-flat	
c) Flat-ripple	d) Ripple-ripple	
5) Which one is sinusoidal oscillator?		
a) Wein bridge	b) Phase shift	
c) Quadrature	d) All of the above	

6)	Ri <sub>f</sub> = Ri(1 + AB) represents a) Input resistance of non-inverting a b) Input resistance of inverting ampli c) Open loop i/p resistance d) None of these	•	lifier	
7)	A(R <sub>1</sub> + R <sub>f</sub> )/(R <sub>1</sub> + R <sub>f</sub> + AR <sub>1</sub> ) represent a) Exact voltage gain of non-inverting b) Exact voltage gain of inverting am c) Ideal voltage gain of inverting amp d) None	g an plifi	er	
8)	Gain limiting frequency of a differential a) $1/2\pi R_f C_1$ c) $1/2\pi R_1 C_f$	b)	ris given by 1/2πR <sub>1</sub> C <sub>1</sub> 1/2πR <sub>f</sub> C <sub>f</sub>	
9)	Slew rate of op-amp is considered for a) AC application c) Both a) and b)	b)	DC application None	
10)	What is the value of CMRR of IC741 (a) 500 nA b) 6 mV		90	d) 90 dB
11)	<ul><li>Which of the following circuit is used</li><li>a) Voltage follower</li><li>c) Current series feedback amplifier</li></ul>	b)	Inverter	der circuit ?
12)	Which of the following is important in a) DIUO c) Level shifting stage	b)	ciding the gain of DIBO Output stage	fthe op-amp?
13)	Which of the below application can be Op-amp?  a) Schmitt trigger  c) Zero Crossing Detector	b)	alized in open lo Peak Detector None	op configuration of
14)	A duty cycle is in saw a) 90% c) Other than 50%	b)	th wave generat 66% 20%	or.



Seat	
No.	

### S.E. (Electronics and Telecommunication Engineering) (Part – II) (CGPA) Examination, 2016 LINEAR INTEGRATED CIRCUITS

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

3) Figure to the **right** indicates **full** marks.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

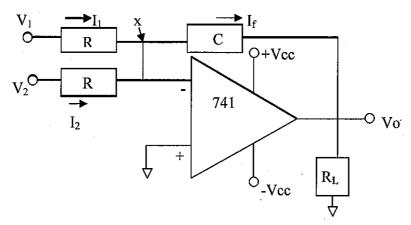
Marks: 56

- a) Design the voltage series feedback amplifier using op-amp IC 741 for the gain between 5 to 10.
- b) Draw and explain frequency response of IC 741.
- c) Explain constant current bias circuit.
- d) Derive output voltage equation for 3 input non-inverting summing amplifier.
- e) Derive open loop voltage gain equation as a function of frequency.

#### 3. Solve any two:

 $(6 \times 2 = 12)$ 

a) Derive output voltage equation for the following circuit and proper name to the circuit.



- b) Explain universal balancing technique.
- c) Compare open loop and closed loop configuration of op-amp. Explain differential amplifier with two op-amp.

Set S

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#### SECTION - II

4. Attempt any four of the following:

(4 marks each)

- a) Explain analog multiplier.
- b) Write a short note on Schmitt trigger.
- c) Draw and explain peak detector using op-amp.
- d) Draw and explain 1st order low pass butter-worth filter.
- e) Explain half wave precision rectifier with waveforms.
- 5. Attempt any two of the following:

(6 marks each)

- a) Draw and explain Wein bridge oscillator.
- b) Explain functional diagram of IC 8308.
- c) Draw and explain square wave generator in detail.

Seat No.

Set P

Max. Marks: 70

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date: Friday, 25-11-2016

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) All questions are compulsory.
- 4) Assume suitable data if necessary.

#### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

1) Which system is non causal system?

a) 
$$y(t) = x(t + 1)$$

b) 
$$y(t) = x(t - 1)$$

c) 
$$y(t) = x(t) + c$$

d) 
$$y(t) = x(t-1) + c$$

2) Identify the non periodic signal

a) 
$$x(t) = cos^2(t)$$

b) 
$$x(t) = \cos 2\pi t u(t)$$

c) 
$$x(t) = \sin(2\pi/3)t$$

d) 
$$x(t) = \sin^2(t)$$

3) Any signal x(t) can be represented as

a) 
$$x_{e}(t) + x_{0}(t)$$

b) 
$$x_{e}(t) - x_{0}(t)$$

c) 
$$x_e(t)/x_0(t)$$

d) 
$$x_e(t)$$
 .  $x_0(t)$ 

4) Which property is not true for convolution integral?

a) 
$$\int_{-\infty}^{\infty} |h(\tau)| d\tau < \infty$$

b) 
$$\int_{-\infty}^{\infty} |h(\tau)| d\tau > 0$$

c) 
$$\int_{-\infty}^{\infty} |h(\tau)| d\tau < 0$$

d) 
$$\int_{-\infty}^{\infty} |h(\tau)| d\tau = 1$$

5)	Find the convolution a) {1, 2, 5, 6} c) {1, 4, 6, 4}	on of x[n] = {1, 2, 2	b)	n] = {1, 2} {0, 4, 3, 1} {4, 2, 3, 1}			
6)	Find the time perio a) $25\pi$	d of $x(t) = \cos(50t)$ b) 50		π/2	d)	π/25	
7)	<ul> <li>7) The following system is y(t) = x(t - 2)</li> <li>a) Causal and Static</li> <li>c) Causal and Dynamic</li> </ul>		2) b) Non causal and Static d) Non causal and Dynamic				
8)	For $x(n) = -u(-n - a) /z/>1$	- 1); then ROC is b) /z/<1	c)	/z/>0	d)	/z/<0	
9)	When the system ha) The system is so b) Time domain be c) The system is ud) The impulse res	table and its impul havior will be expo nstable	se one	response is a de ntially rising sigr	ecay		
10)	Aliasing occurs wh frequency F a) Greater than W c) Greater than 2 V	·	b)	width W is sam Less than W Less than 2 W	plec	I with sampling	
11)	The Fourier transform a) $f(at) \leftrightarrow aF(w)$ c) $f(at) \leftrightarrow (1/a)F(w)$		b)	/ f(at) ↔ (2/a)F( None of these	(w)		
12)	Sampling a signal i a) A sync function c) A train of sync f	·	b)	lying it with A train of impul A rectangular w		ow	
13)	Z transform reduce a) A half circle c) Unit circle	s to Fourier transf	b)	when it is evalu Z circle Imaginary circle		d on	
14)	If x(n) exists only for a) Bilateral c) Both a) and b)	r – 4 < n ≤ 4 then i	b)	called as Unilateral None		sequence.	

Seat No.

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date: Friday, 25-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION-I

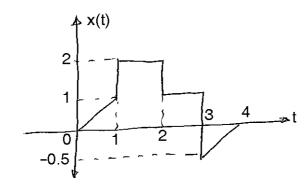
2. Answer any three:

 $(3 \times 4 = 12)$ 

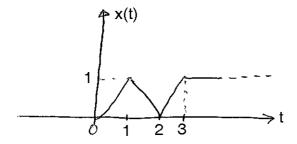
1) Sketch the following signal.

a) 
$$x(-t + 3)$$

b) 
$$x(-2t-3)$$



2) Find even and odd component of the following signal.



-4-



3) Obtain Direct form – I realization for the system described by differential equation

$$\frac{d^{2}y(t)}{dt^{2}} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^{2}x(t)}{dt^{2}}.$$

4) Check for Linear or non linear and causal or non causal  $y(t) = e^{x(t)}$ .

#### 3. Answer any two:

 $(2 \times 8 = 16)$ 

- 1) Find the step response and also check the stability if the impulse response is  $(e^{-2t})u(t)$ .
- 2) Determine the following system is
  - a) Static/Dynamic
  - b) Linear/Non linear
  - c) Causal/Non Causal
  - d) Time Variant/Invariant
- 3) Find the convolution using graphical method  $x[n] = \{1, 2, 3, 2\} h(n) = \{1, 2, 2\}$

#### SECTION - II

#### 4. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) Explain the sampling theorem in detail and define aliasing effect.
- 2) The analog signal m(t) is given as below m(t) =  $4\cos(50 \pi t) + 8\sin(300 \pi t) \cos(100 \pi t)$  calculate Nyquist sampling rate.
- 3) Find Z transform with its ROC for  $(n) = a^n \cdot u(n)$ .
- 4) Obtain Fourier transform of  $(t) = e^{at}$ . u(t).

#### 5. Attempt any two:

 $(2 \times 8 = 16)$ 

- 1) Find the Fourier transform of  $x(t) = e^{-a/t}$  where a > 0.
- 2) Determine the sequence x(n) associated with Z. T given below using power

series method.  $X(z) = 1 + \frac{z^2 + z}{z^2 - 2z + 1}$ ; Right sided sequence.

3) Find Fourier series coefficient using trigonometric Fourier series method for the signal x(t) = t. The signal repeats after every 1 sec.

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Seat	
No.	

Set C

Max. Marks: 70

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date : Friday, 25-11-2016

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) All questions are compulsory.
- 4) Assume **suitable** data if necessary.

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

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

- 1) For x(n) = -u(-n-1); then ROC is
  - a) /z/>1
- b) /z/<1
- c) /z/>0
- d) /z/<0
- 2) 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 rising signal
  - c) The system is unstable
  - d) The impulse response is marginally constant
- 3) Aliasing occurs when a signal of band width W is sampled with sampling frequency F
  - a) Greater than W

b) Less than W

c) Greater than 2 W

- d) Less than 2 W
- 4) The Fourier transform of F(at) is given by
  - a)  $f(at) \leftrightarrow aF(w)$

- b)  $f(at) \leftrightarrow (2/a)F(w)$
- c)  $f(at) \leftrightarrow (1/a)F(w/a)$
- d) None of these



5)	Sampling a signal is equivalent to mu <ul><li>a) A sync function</li><li>c) A train of sync functions</li></ul>	b)	ying it with A train of impulse A rectangular window
6)	Z transform reduces to Fourier transform A half circle c) Unit circle	b)	when it is evaluated on Z circle Imaginary circle
7)	If $x(n)$ exists only for $-4 < n \le 4$ then it a) Bilateral c) Both a) and b)	b)	called as sequence. Unilateral None
8)	Which system is non causal system?  a) $y(t) = x(t + 1)$ c) $y(t) = x(t) + c$	b)	y(t) = x(t - 1) y(t) = x(t - 1) + c
9)	Identify the non periodic signal a) $x(t) = cos^2(t)$ c) $x(t) = sin (2 \pi/3)t$	-	$x(t) = \cos 2\pi t u(t)$ $x(t) = \sin^{2}(t)$
10)	Any signal $x(t)$ can be represented as a) $x_e(t) + x_0(t)$ c) $x_e(t)/x_0(t)$	b)	$x_{e}(t) - x_{0}(t)$ $x_{e}(t) \cdot x_{0}(t)$
11)	Which property is not true for convolu-	tior	n integral ?
	a) $\int_{-\infty}^{\infty}  h(\tau)  d\tau < \infty$	b)	$\int_{-\infty}^{\infty}  h(\tau)  d\tau > 0$
	c) $\int_{-\infty}^{\infty}  h(\tau)  d\tau < 0$	d)	$\int_{-\infty}^{\infty}  h(\tau)  d\tau = 1$
12)	Find the convolution of $x[n] = \{1, 2, 2\}$ a) $\{1, 2, 5, 6\}$ c) $\{1, 4, 6, 4\}$	b)	n] = {1, 2} {0, 4, 3, 1} {4, 2, 3, 1}
13)	Find the time period of $x(t) = cos(50t)$ a) $25 \pi$ b) $50$		$\pi/2$ d) $\pi/25$
14)	The following system is $y(t) = x(t-2)$ a) Causal and Static c) Causal and Dynamic	b)	Non causal and Static Non causal and Dynamic

Seat No.

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date: Friday, 25-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume **suitable** data if necessary.

SECTION-I

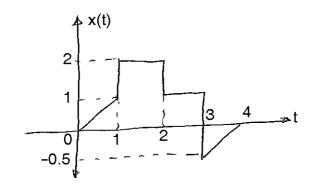
2. Answer any three:

 $(3 \times 4 = 12)$ 

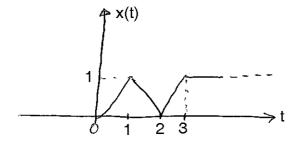
1) Sketch the following signal.

a) 
$$x(-t + 3)$$

b) 
$$x(-2t-3)$$



2) Find even and odd component of the following signal.



-4-



3) Obtain Direct form – I realization for the system described by differential equation

$$\frac{d^{2}y(t)}{dt^{2}} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^{2}x(t)}{dt^{2}}.$$

4) Check for Linear or non linear and causal or non causal  $y(t) = e^{x(t)}$ .

#### 3. Answer any two:

 $(2 \times 8 = 16)$ 

- 1) Find the step response and also check the stability if the impulse response is  $(e^{-2t})u(t)$ .
- 2) Determine the following system is
  - a) Static/Dynamic
  - b) Linear/Non linear
  - c) Causal/Non Causal
  - d) Time Variant/Invariant
- 3) Find the convolution using graphical method  $x[n] = \{1, 2, 3, 2\} h(n) = \{1, 2, 2\}$

#### SECTION - II

#### 4. Attempt any three:

 $(3\times 4=12)$ 

- 1) Explain the sampling theorem in detail and define aliasing effect.
- 2) The analog signal m(t) is given as below m(t) =  $4\cos(50 \pi t) + 8\sin(300 \pi t) \cos(100 \pi t)$  calculate Nyquist sampling rate.
- 3) Find Z transform with its ROC for  $(n) = a^n \cdot u(n)$ .
- 4) Obtain Fourier transform of  $(t) = e^{at}$ . u(t).

#### 5. Attempt any two:

 $(2 \times 8 = 16)$ 

- 1) Find the Fourier transform of  $x(t) = e^{-a/t}$  where a > 0.
- 2) Determine the sequence x(n) associated with Z. T given below using power

series method. 
$$X(z) = 1 + \frac{z^2 + z}{z^2 - 2z + 1}$$
; Right sided sequence.

3) Find Fourier series coefficient using trigonometric Fourier series method for the signal x(t) = t. The signal repeats after every 1 sec.

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Seat	
No.	

Set R

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date: Friday, 25-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) All questions are compulsory.
- 4) Assume **suitable** data if necessary.

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

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

- 1) Find the convolution of  $x[n] = \{1, 2, 2\} h[n] = \{1, 2\}$ 
  - a) {1, 2, 5, 6}

b) {0, 4, 3, 1}

c) {1, 4, 6, 4}

d) {4, 2, 3, 1}

- 2) Find the time period of x(t) = cos(50t)
  - a)  $25\pi$
- b) 50
- c)  $\pi/2$
- d)  $\pi/25$

- 3) The following system is y(t) = x(t-2)
  - a) Causal and Static

b) Non causal and Static

c) Causal and Dynamic

d) Non causal and Dynamic

- 4) For x(n) = -u(-n-1); then ROC is
  - a) z/>1
- b) /z/<1
- c) /z/>0
- d) /z/<0
- 5) 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 rising signal
  - c) The system is unstable
  - d) The impulse response is marginally constant

- Aliasing occurs when a signal of band width W is sampled with sampling frequency F
  - a) Greater than W

b) Less than W

c) Greater than 2 W

- d) Less than 2 W
- 7) The Fourier transform of F(at) is given by
  - a)  $f(at) \leftrightarrow aF(w)$

- b)  $f(at) \leftrightarrow (2/a)F(w)$
- c)  $f(at) \leftrightarrow (1/a)F(w/a)$
- d) None of these
- 8) Sampling a signal is equivalent to multiplying it with
  - a) A sync function

- b) A train of impulse
- c) A train of sync functions
- d) A rectangular window
- 9) Z transform reduces to Fourier transform when it is evaluated on
  - a) A half circle

b) Z circle

c) Unit circle

- d) Imaginary circle
- 10) If x(n) exists only for  $-4 < n \le 4$  then it is called as \_\_\_\_\_ sequence.
  - a) Bilateral

b) Unilateral

c) Both a) and b)

- d) None
- 11) Which system is non causal system?
  - a) y(t) = x(t + 1)

b) y(t) = x(t - 1)

c) y(t) = x(t) + c

- d) y(t) = x(t-1) + c
- 12) Identify the non periodic signal
  - a)  $x(t) = cos^2(t)$

b)  $x(t) = \cos 2\pi t u(t)$ 

c)  $x(t) = \sin (2\pi/3)t$ 

- d)  $x(t) = \sin^2(t)$
- 13) Any signal x(t) can be represented as
  - a)  $x_e(t) + x_0(t)$

b)  $x_{e}(t) - x_{0}(t)$ 

c)  $x_e(t)/x_0(t)$ 

- d)  $x_{e}(t) . x_{0}(t)$
- 14) Which property is not true for convolution integral?
  - a)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau < \infty$

b)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau > 0$ 

c)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau < 0$ 

d)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau = 1$ 

Seat No.

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date: Friday, 25-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION-I

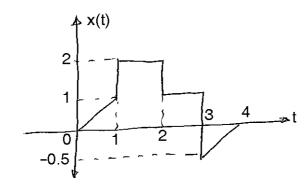
2. Answer any three:

 $(3\times 4=12)$ 

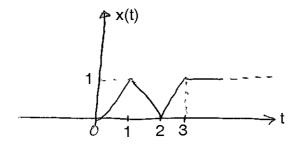
1) Sketch the following signal.

a) 
$$x(-t + 3)$$

b) 
$$x(-2t-3)$$



2) Find even and odd component of the following signal.



-4-



3) Obtain Direct form – I realization for the system described by differential equation

$$\frac{d^{2}y(t)}{dt^{2}} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^{2}x(t)}{dt^{2}}.$$

4) Check for Linear or non linear and causal or non causal  $y(t) = e^{x(t)}$ .

#### 3. Answer any two:

 $(2 \times 8 = 16)$ 

- 1) Find the step response and also check the stability if the impulse response is  $(e^{-2t})u(t)$ .
- 2) Determine the following system is
  - a) Static/Dynamic
  - b) Linear/Non linear
  - c) Causal/Non Causal
  - d) Time Variant/Invariant
- 3) Find the convolution using graphical method  $x[n] = \{1, 2, 3, 2\} h(n) = \{1, 2, 2\}$

#### SECTION - II

#### 4. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) Explain the sampling theorem in detail and define aliasing effect.
- 2) The analog signal m(t) is given as below m(t) =  $4\cos(50 \pi t) + 8\sin(300 \pi t) \cos(100 \pi t)$  calculate Nyquist sampling rate.
- 3) Find Z transform with its ROC for  $(n) = a^n \cdot u(n)$ .
- 4) Obtain Fourier transform of  $(t) = e^{at}$ . u(t).

#### 5. Attempt any two:

 $(2 \times 8 = 16)$ 

- 1) Find the Fourier transform of  $x(t) = e^{-a/t}$  where a > 0.
- 2) Determine the sequence x(n) associated with Z. T given below using power

series method.  $X(z) = 1 + \frac{z^2 + z}{z^2 - 2z + 1}$ ; Right sided sequence.

3) Find Fourier series coefficient using trigonometric Fourier series method for the signal x(t) = t. The signal repeats after every 1 sec.

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Seat

#### **SLR-EP - 134**

No.	Set	S
	S.E. (Electronics and Telecommunication) (Part – II) (CGPA)  Examination, 2016  SIGNALS AND SYSTEMS	

Day and Date: Friday, 25-11-2016 Max. Marks: 70

Time: 3.00 p.m. to 6.00 p.m.

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

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

4) Assume <b>suitab</b>	ole data if necessary.	
MCQ/Objecti Duration: 30 Minutes	ve Type Questions	Marks : 14
Choose the correct answer:		(1×14=14)
Aliasing occurs when a signal of frequency F	of band width W is sampled v	,
<ul><li>a) Greater than W</li><li>c) Greater than 2 W</li></ul>	<ul><li>b) Less than W</li><li>d) Less than 2 W</li></ul>	
<ul> <li>2) The Fourier transform of F(at) is</li> <li>a) f(at) ↔ aF(w)</li> <li>c) f(at) ↔ (1/a)F(w/a)</li> </ul>	given by b) f(at) ↔ (2/a)F(w) d) None of these	
<ul><li>3) Sampling a signal is equivalent to</li><li>a) A sync function</li><li>c) A train of sync functions</li></ul>	b) A train of impulse	V
<ul><li>4) Z transform reduces to Fourier tr</li><li>a) A half circle</li><li>c) Unit circle</li></ul>	ansform when it is evaluated b) Z circle d) Imaginary circle	on
<ul><li>5) If x(n) exists only for – 4 &lt; n ≤ 4 to a) Bilateral</li><li>c) Both a) and b)</li></ul>	hen it is called as b) Unilateral d) None	sequence.

- 6) Which system is non causal system?
  - a) y(t) = x(t + 1)

b) y(t) = x(t - 1)

c) y(t) = x(t) + c

- d) y(t) = x(t-1) + c
- 7) Identify the non periodic signal
  - a)  $x(t) = cos^2(t)$

b)  $x(t) = \cos 2\pi t u(t)$ 

c)  $x(t) = \sin(2\pi/3)t$ 

- d)  $x(t) = \sin^2(t)$
- 8) Any signal x(t) can be represented as
  - a)  $x_{e}(t) + x_{0}(t)$

b)  $x_{e}(t) - x_{0}(t)$ 

c)  $x_e(t)/x_0(t)$ 

- d)  $x_e(t)$  .  $x_0(t)$
- 9) Which property is not true for convolution integral?
  - a)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau < \infty$

b)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau > 0$ 

c)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau < 0$ 

- d)  $\int_{-\infty}^{\infty} |h(\tau)| d\tau = 1$
- 10) Find the convolution of  $x[n] = \{1, 2, 2\} h[n] = \{1, 2\}$ 
  - a) {1, 2, 5, 6}

b) {0, 4, 3, 1}

c) {1, 4, 6, 4}

- d) {4, 2, 3, 1}
- 11) Find the time period of x(t) = cos(50t)
  - a)  $25\pi$
- b) 50
- c)  $\pi/2$
- d)  $\pi/25$

- 12) The following system is y(t) = x(t-2)
  - a) Causal and Static

- b) Non causal and Static
- c) Causal and Dynamic
- d) Non causal and Dynamic
- 13) For x(n) = -u(-n-1); then ROC is
  - a) /z/>1
- b) /z/<1
- c) /z/>0
- d) /z/<0
- 14) 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 rising signal
  - c) The system is unstable
  - d) The impulse response is marginally constant

\_\_\_\_\_

Seat No.

### S.E. (Electronics and Telecommunication) (Part – II) (CGPA) Examination, 2016 SIGNALS AND SYSTEMS

Day and Date: Friday, 25-11-2016 Marks: 56

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION-I

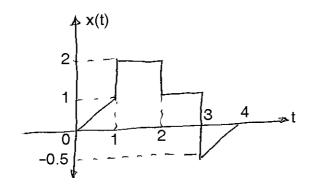
2. Answer any three:

 $(3\times 4=12)$ 

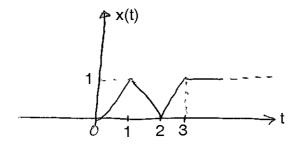
1) Sketch the following signal.

a) 
$$x(-t + 3)$$

b) 
$$x(-2t-3)$$



2) Find even and odd component of the following signal.





3) Obtain Direct form – I realization for the system described by differential equation

-4-

$$\frac{d^{2}y(t)}{dt^{2}} - \frac{dy(t)}{dt} - 2y(t) = x(t) + \frac{d^{2}x(t)}{dt^{2}}.$$

4) Check for Linear or non linear and causal or non causal  $y(t) = e^{x(t)}$ .

#### 3. Answer any two:

 $(2 \times 8 = 16)$ 

- 1) Find the step response and also check the stability if the impulse response is  $(e^{-2t})u(t)$ .
- 2) Determine the following system is
  - a) Static/Dynamic
  - b) Linear/Non linear
  - c) Causal/Non Causal
  - d) Time Variant/Invariant
- 3) Find the convolution using graphical method  $x[n] = \{1, 2, 3, 2\} h(n) = \{1, 2, 2\}$

#### SECTION - II

#### 4. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) Explain the sampling theorem in detail and define aliasing effect.
- 2) The analog signal m(t) is given as below m(t) =  $4\cos(50 \pi t) + 8\sin(300 \pi t) \cos(100 \pi t)$  calculate Nyquist sampling rate.
- 3) Find Z transform with its ROC for  $(n) = a^n \cdot u(n)$ .
- 4) Obtain Fourier transform of  $(t) = e^{at}$ . u(t).

#### 5. Attempt any two:

 $(2 \times 8 = 16)$ 

- 1) Find the Fourier transform of  $x(t) = e^{-a/t}$  where a > 0.
- 2) Determine the sequence x(n) associated with Z. T given below using power

series method.  $X(z) = 1 + \frac{z^2 + z}{z^2 - 2z + 1}$ ; Right sided sequence.

3) Find Fourier series coefficient using trigonometric Fourier series method for the signal x(t) = t. The signal repeats after every 1 sec.

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Max. Marks: 70

Seat	Cat	_
No.	Set F	J

### T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016

### **ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)**

Day and Date: Monday, 28-11-2016

Time: 10.00 a.m to 1.00 p.m.

- Instructions: 1) Assume suitable data wherever necessary.
  - 2) Figures to the right indicate full marks.
  - 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

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

Duration: 30 Minutes Marks: 14

1. Choose the correct option:

 $(1 \times 14 = 14)$ 

- 1) If pair of +ve and –ve charges of 2C separated by distance  $3\mu m$  then the magnitude of dipole moment is
  - a) 2 C-μm

b) 1.5 C-m

c) 6 C-µm

- d) 3 C-μm
- 2) If the voltage applied across the capacitor is increased, the capacitance value
  - a) increases

b) decreases

c) remains constant

- d) becomes infinity
- 3) If the direction of Coulomb's Force on a unit charge is  $\frac{1}{ax}$ , the direction of electric field intensity is
  - a)  $\overline{ay}$

b)  $\overline{-ax}$ 

c) az

- d)  $\overline{ax}$
- 4) Divergence theorem relates
  - a) Line integral with volume integral
  - b) Line integral with surface integral
  - c) Surface integral with volume integral
  - d) Surface integral with surface integral

5)	The normal components of D are a) Discontinuous c) zero		Continuous
6)	The electric field intensity E at a point is		
	a) 7 V/m c) 1/7 V/m	,	0 V/m None of these
7)	Which of the following is meaningless	,	
.,	a) grad div		curl div
	c) curl grad	ď)	none of these
8)	Magnetic flux density is a relation of		
	a) Current and area	,	Area and its direction
	c) Magnetic flux and area	,	None of these
9)	Total flux passing through a closed su		_
	a) Infinity	,	Zero
10)	c) Unity	u)	None of these
10)	Energy density W <sub>H</sub> is given as a) Energy per volume	h)	Energy per area
	c) Linear energy		All of these
11)	A Loop antenna may be of	,	
,	a) Square on triangular shape	b)	Hexagonal shape
	c) Circular shape	d)	Any of the above
12)	The wave equation is		
	a) $\nabla \overline{E} = Y \overline{E}$	b)	$\nabla^2 \overline{E} = Y \overline{E}$
	c) $\nabla^2 \overline{E} = Y^2 \overline{E}$	d)	$\nabla \overline{E} = Y^2 \overline{E}$
13)	The unit of vector magnetic potential i	s	
,	a) flux		volt
	c) v/m	d)	wb/m
14)	$ abla . ar{J} = 0 $ is frequently known as a) Continuity equation for steady curr b) Laplace equation c) Poisson's equation d) None of these	rents	S



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## T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016 ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)

Day and Date: Monday, 28-11-2016 Marks: 56

Time: 10.00 a.m to 1.00 p.m.

**Instruction**: 1) Assume suitable data **wherever** necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

#### 2. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) State and prove Gauss' Law.
- 2) Charge  $Q_1 = -10$  nC is at origin in free space. In order to make x-component of  $\overline{E} = 0$  at point (3, 1, 1), what charge  $Q_t$  should be kept at point (2, 0, 0)?
- 3) Derive an equation of potential for a dipole.
- 4)  $V=150~x^{4/3}$  for x>0 with  $\epsilon=\epsilon_0$  , find  $\overline{E},~\overline{D},~\rho_V$  as a function of x.
- 5) Let  $\overline{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\frac{C}{m^2}$  in spherical co-ordinates. Find volume charge density for r = 1m.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Verify Divergence theorem for  $\overline{D} = \frac{2}{z^2} \left( yz \, \overline{ax} + xz \, \overline{ay} 2xy \, \overline{az} \right)$  C/m<sup>3</sup> for 2 < x < 3, 2 < y < 3, 2 < z < 3.
- b) Derive an expression for electric field intensity on in xy plane produced by an infinite uniform line charge placed along z axis.
- c) Derive boundary conditions for perfect dielectrics.

Set P



#### SECTION - II

#### 4. Solve any three:

 $(3 \times 4 = 12)$ 

- 1) Derive Amperes law of differential current element.
- 2) State and explain Biot-Savarts law.
- 3) Explain following parameters of antenna.
  - a) Directive Gain
  - b) Power Gain
  - c) Antenna Efficiency
- 4) Given that  $\overline{H} = H_m e^{j(\omega t + \beta z)} = \overline{a}_x$  in free space. Find  $\overline{E}$ .
- 5) A Infinite current filament is placed at y = 2, z = -1. Find magnetic field intensity at P(2, 3, 4) when carries current of 1A.

#### 5. Solve any two:

 $(2 \times 8 = 16)$ 

- 1) Derive expression on magnetic field intensity due to finite current element.
- 2) What values of A and  $\beta$  are required of two fields  $\overline{E}=120\pi\cos\left(10^6\pi t-\beta x\right)\overline{a}_y$  (V/m) and  $\overline{H}=A\cos\left(10^6\pi t-\beta x\right)\overline{a}_z$  (A/m)? Satisfy Maxwell's equation in a medium where  $\mu_r=\epsilon_r=4$  and  $\sigma=0$ .
- 3) Derive the expression for Linear array with n sources of equal amplitude and spacing and explain for end-fire case.

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## T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016 ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)

Day and Date: Monday, 28-11-2016 Max. Marks: 70

Time: 10.00 a.m to 1.00 p.m.

Instructions: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.

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

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

Duration: 30 Minutes Marks: 14

1. Choose the correct option:

 $(1 \times 14 = 14)$ 

1) Magnetic flux density is a relation of

a) Current and area

b) Area and its direction

c) Magnetic flux and area

d) None of these

2) Total flux passing through a closed surface held in a magnetic field is

a) Infinity

b) Zero

c) Unity

d) None of these

3) Energy density  $W_H$  is given as

a) Energy per volume

b) Energy per area

c) Linear energy

d) All of these

4) A Loop antenna may be of

a) Square on triangular shape

b) Hexagonal shape

c) Circular shape

d) Any of the above

5) The wave equation is

a)  $\nabla \overline{E} = Y \overline{E}$ 

b)  $\nabla^2 \overline{E} = Y \overline{E}$ 

c)  $\nabla^2 \overline{E} = Y^2 \overline{E}$ 

d)  $\nabla \overline{E} = Y^2 \overline{E}$ 

b) 0 V/m

b) curl div

d) None of these

d) none of these

a) 7 V/m

c) 1/7 V/m

a) grad div

c) curl grad

14) Which of the following is meaningless combination?



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## T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016 ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)

Day and Date: Monday, 28-11-2016 Marks: 56

Time: 10.00 a.m to 1.00 p.m.

Instruction: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

#### 2. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) State and prove Gauss' Law.
- 2) Charge  $Q_1 = -10$  nC is at origin in free space. In order to make x-component of  $\overline{E} = 0$  at point (3, 1, 1), what charge  $Q_t$  should be kept at point (2, 0, 0)?
- 3) Derive an equation of potential for a dipole.
- 4)  $V=150~x^{4/3}$  for x>0 with  $\epsilon=\epsilon_0$  , find  $\overline{E},~\overline{D},~\rho_V$  as a function of x.
- 5) Let  $\overline{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\frac{C}{m^2}$  in spherical co-ordinates. Find volume charge density for r = 1m.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Verify Divergence theorem for  $\overline{D} = \frac{2}{z^2} \left( yz \, \overline{ax} + xz \, \overline{ay} 2xy \, \overline{az} \right)$  C/m<sup>3</sup> for  $2 \le x \le 3$ ,  $2 \le y \le 3$ ,  $2 \le z \le 3$ .
- b) Derive an expression for electric field intensity on in xy plane produced by an infinite uniform line charge placed along z axis.
- c) Derive boundary conditions for perfect dielectrics.



 $(3 \times 4 = 12)$ 

#### SECTION - II

4. Solve any three:

- 1) Derive Amperes law of differential current element.
- 2) State and explain Biot-Savarts law.
- 3) Explain following parameters of antenna.
  - a) Directive Gain
  - b) Power Gain
  - c) Antenna Efficiency
- 4) Given that  $\overline{H} = H_m e^{j(\omega t + \beta z)} = \overline{a}_x$  in free space. Find  $\overline{E}$ .
- 5) A Infinite current filament is placed at y = 2, z = -1. Find magnetic field intensity at P(2, 3, 4) when carries current of 1A.

5. Solve any two: (2×8=16)

- 1) Derive expression on magnetic field intensity due to finite current element.
- 2) What values of A and  $\beta$  are required of two fields  $\overline{E} = 120\pi \cos\left(10^6\pi t \beta x\right)\overline{a}_y$  (V/m) and  $\overline{H} = A\cos\left(10^6\pi t \beta x\right)\overline{a}_z$  (A/m)? Satisfy Maxwell's equation in a medium where  $\mu_r = \epsilon_r = 4$  and  $\sigma = 0$ .
- Derive the expression for Linear array with n sources of equal amplitude and spacing and explain for end-fire case.

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# T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016 ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)

Day and Date: Monday, 28-11-2016 Max. Marks: 70

Time: 10.00 a.m to 1.00 p.m.

- Instructions: 1) Assume suitable data wherever necessary.
  - 2) Figures to the right indicate full marks.
  - 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
  - 4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

	MCQ/Objective T	ype Questions
Duratio	n : 30 Minutes	Marks : 14
1. Ch	oose the correct option :	(1×14=14)
1)	The normal components of D are a) Discontinuous c) zero	across a dielectric boundary. b) Continuous d) ∞
2)	The electric field intensity E at a point is a) 7 V/m	(1, 2, 2) due to 7 nC located at (0, 0, 0) b) 0 V/m
	c) 1/7 V/m	d) None of these
3)	Which of the following is meaningless	combination?
	a) grad div	b) curl div
	c) curl grad	d) none of these
4)	Magnetic flux density is a relation of a) Current and area c) Magnetic flux and area	<ul><li>b) Area and its direction</li><li>d) None of these</li></ul>
5)	Total flux passing through a closed so a) Infinity c) Unity	urface held in a magnetic field is b) Zero d) None of these

6)	Energy	density	$W_H$	is	given	as
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- a) Energy per volume
- c) Linear energy

- b) Energy per area
- d) All of these

#### 7) A Loop antenna may be of

- a) Square on triangular shape
- c) Circular shape

- b) Hexagonal shape
- d) Any of the above

#### 8) The wave equation is

a) 
$$\nabla \overline{E} = Y \overline{E}$$

b) 
$$\nabla^2 \overline{E} = Y \overline{E}$$

c) 
$$\nabla^2 \overline{E} = Y^2 \overline{E}$$

d) 
$$\nabla \overline{E} = Y^2 \overline{E}$$

#### 9) The unit of vector magnetic potential is

a) flux

b) volt

c) v/m

d) wb/m

#### 10) $\nabla . \bar{J} = 0$ is frequently known as

- a) Continuity equation for steady currents
- b) Laplace equation
- c) Poisson's equation
- d) None of these
- 11) If pair of +ve and –ve charges of 2C separated by distance  $3\mu m$  then the magnitude of dipole moment is
  - a) 2 C-μm

b) 1.5 C-m

c) 6 C- µm

d) 3 C-μm

#### 12) If the voltage applied across the capacitor is increased, the capacitance value

a) increases

b) decreases

c) remains constant

- d) becomes infinity
- 13) If the direction of Coulomb's Force on a unit charge is  $\overline{ax}$ , the direction of electric field intensity is
  - a)  $\overline{ay}$

b)  $\overline{-ax}$ 

c)  $\overline{az}$ 

d)  $\overline{ax}$ 

#### 14) Divergence theorem relates

- a) Line integral with volume integral
- b) Line integral with surface integral
- c) Surface integral with volume integral
- d) Surface integral with surface integral

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## T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016 ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)

Day and Date: Monday, 28-11-2016 Marks: 56

Time: 10.00 a.m to 1.00 p.m.

Instruction: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

#### 2. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) State and prove Gauss' Law.
- 2) Charge  $Q_1 = -10$  nC is at origin in free space. In order to make x-component of  $\overline{E} = 0$  at point (3, 1, 1), what charge  $Q_t$  should be kept at point (2, 0, 0)?
- 3) Derive an equation of potential for a dipole.
- 4)  $V=150~x^{4/3}$  for x>0 with  $\epsilon=\epsilon_0$  , find  $\overline{E},~\overline{D},~\rho_V$  as a function of x.
- 5) Let  $\overline{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\frac{C}{m^2}$  in spherical co-ordinates. Find volume charge density for r = 1m.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Verify Divergence theorem for  $\overline{D} = \frac{2}{z^2} \left( yz \, \overline{ax} + xz \, \overline{ay} 2xy \, \overline{az} \right)$  C/m<sup>3</sup> for  $2 \le x \le 3$ ,  $2 \le y \le 3$ ,  $2 \le z \le 3$ .
- b) Derive an expression for electric field intensity on in xy plane produced by an infinite uniform line charge placed along z axis.
- c) Derive boundary conditions for perfect dielectrics.

Set R



 $(3 \times 4 = 12)$ 

#### SECTION - II

4. Solve any three:

- 1) Derive Amperes law of differential current element.
- 2) State and explain Biot-Savarts law.
- 3) Explain following parameters of antenna.
  - a) Directive Gain
  - b) Power Gain
  - c) Antenna Efficiency
- 4) Given that  $\overline{H} = H_m e^{j(\omega t + \beta z)} = \overline{a}_x$  in free space. Find  $\overline{E}$ .
- 5) A Infinite current filament is placed at y = 2, z = -1. Find magnetic field intensity at P(2, 3, 4) when carries current of 1A.

5. Solve any two: (2×8=16)

- 1) Derive expression on magnetic field intensity due to finite current element.
- 2) What values of A and  $\beta$  are required of two fields  $\overline{E}=120\pi\cos\left(10^6\pi t-\beta x\right)\overline{a}_y$  (V/m) and  $\overline{H}=A\cos\left(10^6\pi t-\beta x\right)\overline{a}_z$  (A/m)? Satisfy Maxwell's equation in a medium where  $\mu_r=\epsilon_r=4$  and  $\sigma=0$ .
- 3) Derive the expression for Linear array with n sources of equal amplitude and spacing and explain for end-fire case.

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Max. Marks: 70

# T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016

# **ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)**

Day and Date: Monday, 28-11-2016

Time: 10.00 a.m to 1.00 p.m.

Instructions: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.

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

#### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

1. Choose the correct option:

 $(1 \times 14 = 14)$ 

1) Energy density W<sub>H</sub> is given as

a) Energy per volume

c) Linear energy

b) Energy per area

d) All of these

2) A Loop antenna may be of

a) Square on triangular shape

c) Circular shape

b) Hexagonal shape

d) Any of the above

3) The wave equation is

a)  $\nabla \overline{E} = Y \overline{E}$ 

b)  $\nabla^2 \overline{E} = Y \overline{E}$ 

c)  $\nabla^2 \overline{E} = Y^2 \overline{E}$ 

d)  $\nabla \overline{E} = Y^2 \overline{E}$ 

4) The unit of vector magnetic potential is

a) flux

b) volt

c) v/m

d) wb/m

5)  $\nabla . \bar{J} = 0$  is frequently known as

- a) Continuity equation for steady currents
- b) Laplace equation
- c) Poisson's equation
- d) None of these



6)	If pair of +ve and -ve charges of 2C magnitude of dipole moment is	separated by distance $3\mu m$ then the
	<ul><li>a) 2 C-μm</li><li>c) 6 C-μm</li></ul>	<ul><li>b) 1.5 C-m</li><li>d) 3 C-μm</li></ul>
7)	If the voltage applied across the capaca) increases c) remains constant	b) decreased, the capacitance value b) decreases d) becomes infinity
8)	If the direction of Coulomb's Force o electric field intensity is	n a unit charge is $\overline{ax}$ , the direction of
	a) $\overline{ay}$	b) $\overline{-ax}$
	c) az	d) ax
9)	Divergence theorem relates <ul><li>a) Line integral with volume integral</li><li>b) Line integral with surface integral</li><li>c) Surface integral with volume integral</li><li>d) Surface integral with surface integral</li></ul>	
10)	The normal components of D are a) Discontinuous c) zero	across a dielectric boundary. b) Continuous d) ∞
	<ul><li>a) Discontinuous</li><li>c) zero</li></ul>	b) Continuous
	<ul><li>a) Discontinuous</li><li>c) zero</li><li>The electric field intensity E at a point is</li><li>a) 7 V/m</li></ul>	<ul> <li>b) Continuous</li> <li>d) ∞</li> <li>(1, 2, 2) due to 7 nC located at (0, 0, 0)</li> <li>b) 0 V/m</li> </ul>
11)	<ul> <li>a) Discontinuous</li> <li>c) zero</li> <li>The electric field intensity E at a point is</li> <li>a) 7 V/m</li> <li>c) 1/7 V/m</li> </ul>	<ul> <li>b) Continuous</li> <li>d) ∞</li> <li>(1, 2, 2) due to 7 nC located at (0, 0, 0)</li> <li>b) 0 V/m</li> <li>d) None of these</li> </ul>
11)	<ul> <li>a) Discontinuous</li> <li>c) zero</li> <li>The electric field intensity E at a point is</li> <li>a) 7 V/m</li> <li>c) 1/7 V/m</li> <li>Which of the following is meaningless</li> </ul>	b) Continuous d) $\infty$ (1, 2, 2) due to 7 nC located at (0, 0, 0) b) 0 V/m d) None of these combination?
11)	<ul> <li>a) Discontinuous</li> <li>c) zero</li> <li>The electric field intensity E at a point is</li> <li>a) 7 V/m</li> <li>c) 1/7 V/m</li> <li>Which of the following is meaningless</li> <li>a) grad div</li> </ul>	<ul> <li>b) Continuous</li> <li>d) ∞</li> <li>(1, 2, 2) due to 7 nC located at (0, 0, 0)</li> <li>b) 0 V/m</li> <li>d) None of these</li> <li>combination ?</li> <li>b) curl div</li> </ul>
11) 12)	<ul> <li>a) Discontinuous</li> <li>c) zero</li> <li>The electric field intensity E at a point is</li> <li>a) 7 V/m</li> <li>c) 1/7 V/m</li> <li>Which of the following is meaningless</li> <li>a) grad div</li> <li>c) curl grad</li> </ul>	b) Continuous d) $\infty$ (1, 2, 2) due to 7 nC located at (0, 0, 0) b) 0 V/m d) None of these combination?
11) 12)	<ul> <li>a) Discontinuous</li> <li>c) zero</li> <li>The electric field intensity E at a point is</li> <li>a) 7 V/m</li> <li>c) 1/7 V/m</li> <li>Which of the following is meaningless</li> <li>a) grad div</li> </ul>	<ul> <li>b) Continuous</li> <li>d) ∞</li> <li>(1, 2, 2) due to 7 nC located at (0, 0, 0)</li> <li>b) 0 V/m</li> <li>d) None of these</li> <li>combination ?</li> <li>b) curl div</li> </ul>
11) 12)	<ul> <li>a) Discontinuous</li> <li>c) zero</li> <li>The electric field intensity E at a point is</li> <li>a) 7 V/m</li> <li>c) 1/7 V/m</li> <li>Which of the following is meaningless</li> <li>a) grad div</li> <li>c) curl grad</li> <li>Magnetic flux density is a relation of</li> <li>a) Current and area</li> <li>c) Magnetic flux and area</li> </ul>	<ul> <li>b) Continuous</li> <li>d) ∞</li> <li>(1, 2, 2) due to 7 nC located at (0, 0, 0)</li> <li>b) 0 V/m</li> <li>d) None of these</li> <li>combination?</li> <li>b) curl div</li> <li>d) none of these</li> <li>b) Area and its direction</li> <li>d) None of these</li> </ul>



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# T.E. (Electronics and Telecommunication Engg.) (Part – I) (CGPA) Examination, 2016 ELECTROMAGNETIC ENGG. AND RADIATING SYSTEMS (New)

Day and Date: Monday, 28-11-2016 Marks: 56

Time: 10.00 a.m to 1.00 p.m.

Instruction: 1) Assume suitable data wherever necessary.

2) Figures to the right indicate full marks.

#### SECTION - I

#### 2. Attempt any three:

 $(3 \times 4 = 12)$ 

- 1) State and prove Gauss' Law.
- 2) Charge  $Q_1 = -10$  nC is at origin in free space. In order to make x-component of  $\overline{E} = 0$  at point (3, 1, 1), what charge  $Q_t$  should be kept at point (2, 0, 0)?
- 3) Derive an equation of potential for a dipole.
- 4)  $V=150~x^{4/3}$  for x>0 with  $\epsilon=\epsilon_0$  , find  $\overline{E},~\overline{D},~\rho_V$  as a function of x.
- 5) Let  $\overline{D} = \left(10r^2 + 5e^{-r}\right)\overline{ar}\frac{C}{m^2}$  in spherical co-ordinates. Find volume charge density for r = 1m.

### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Verify Divergence theorem for  $\overline{D} = \frac{2}{z^2} \left( yz \, \overline{ax} + xz \, \overline{ay} 2xy \, \overline{az} \right)$  C/m<sup>3</sup> for 2 < x < 3, 2 < y < 3, 2 < z < 3.
- b) Derive an expression for electric field intensity on in xy plane produced by an infinite uniform line charge placed along z axis.
- c) Derive boundary conditions for perfect dielectrics.



#### 4. Solve any three:

 $(3 \times 4 = 12)$ 

- 1) Derive Amperes law of differential current element.
- 2) State and explain Biot-Savarts law.
- 3) Explain following parameters of antenna.
  - a) Directive Gain
  - b) Power Gain
  - c) Antenna Efficiency
- 4) Given that  $\overline{H} = H_m e^{j(\omega t + \beta z)} = \overline{a}_x$  in free space. Find  $\overline{E}$ .
- 5) A Infinite current filament is placed at y = 2, z = -1. Find magnetic field intensity at P(2, 3, 4) when carries current of 1A.

#### 5. Solve any two:

 $(2 \times 8 = 16)$ 

- 1) Derive expression on magnetic field intensity due to finite current element.
- 2) What values of A and  $\beta$  are required of two fields  $\overline{E} = 120\pi \cos\left(10^6\pi t \beta x\right)\overline{a}_y$  (V/m) and  $\overline{H} = A\cos\left(10^6\pi t \beta x\right)\overline{a}_z$  (A/m)? Satisfy Maxwell's equation in a medium where  $\mu_r = \epsilon_r = 4$  and  $\sigma = 0$ .
- 3) Derive the expression for Linear array with n sources of equal amplitude and spacing and explain for end-fire case.

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### T.E. (E&TC) (Part – I) Examination, 2016 (New CGPA) PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date: Wednesday, 30-11-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if necessary.

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

Duration: 30 Minutes Marks: 14

- 1. Choose the correct answer:
  - 1) The entropy of a message source generating four messages with probability 0.5, 0.25, 0.125, 0.125 is
    - a) 1 bit/message

b) 1.75 bit/message

c) 3.32 bit/message

- d) 5.93 bit/message
- 2) The baud rate when using binary transmission is
  - a) always equal to the bit rate
  - b) equal to twice the bandwidth of an ideal channel
  - c) not equal to the signaling rate
  - d) equal to one half of the bandwidth of ideal channel
- 3) The circuit required to generate the flat topped PAM signal is
  - a) a simple integrator circuit

b) a differentiator circuit

c) a sample and hold circuit

- d) none of these
- 4) In a DM system, the granular (idling) noise occurs when the modulating signal
  - a) increases rapidly
  - b) remains constant
  - c) decreases rapidly
  - d) nature of modulating signal has nothing to do with this noise
- 5) The quantizer in the PCM transmitter is used for
  - a) converting analog signal into N bit digital word
  - b) converting the N bit parallel word into a serial output
  - c) rounding off each sample value of its nearest standard value
  - d) none of the above

-2-



6)	In an eye pattern opening of eye indicat	es			
	a) ISI increases	b)	ISI decreases		
	c) Timing jitter increases	d)	Timing jitter deci	reas	ses
7)	Which encoding method uses alternating	ıg p	ositive and negat	ive	values for 1's ?
	a) NRZ-1 b) RZ	c)	Manchester	d)	AMI
8)	most affected by noise.				
	a) PSK b) ASK	c)	FSK	d)	DPSK
9)	In a continuous wave modulation scheme signal is	e the	e input signal is		_and transmitted
	a) analog, analog	b)	digital, analog		
	c) digital, digital	d)	analog, digital		
0)	In a QAM both identities are varied				
	a) amplitude and phase	b)	frequency and p	has	e
	c) bit rate and phase	d)	baud rate and ph	nas	е
1)	The noise immunity of 16 QASK is		than 16 PSK.		
	a) Less b) High	c)	Equal	d)	None
12)	If in a particular digital communication s is an optimum coherent receiver, the char using rectangular pulses then which o inconsistent? The receiver is	nne	I noise is white and	d bi	ts are transmitted
	a) a correlation receiver	b)	matched filter red	ceiv	/er
	c) an integrate and dump receiver	d)	sample, hold and	d dı	ump receiver
(3)	Costas loop is a method for				
	a) Frame synchronization	b)	Carrier synchron	niza	tion
	c) Symbol synchronization	d)	None of these		
14)	Multichannel signal transmission is comovercome the effects of	nmo	nly used on time	var	ying channels to
	a) attenuation	b)	amplification		
	c) phase shift	d)	signal fading		



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# T.E. (E&TC) (Part – I) Examination, 2016 (New CGPA) PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date: Wednesday, 30-11-2016

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION – I 28

2. Answer any four of the following:

 $(4 \times 4 = 16)$ 

Marks: 56

- a) With the help of block diagram explain the working of Adaptive Delta Modulation.
- b) Explain M-ary signaling schemes. What are the advantages of M-ary signaling scheme over Binary signaling scheme?
- c) With the circuit diagram explain a PPM modulator and demodulator.
- d) What is the significance of eye diagram? Explain.
- e) An events has 6 possible outcomes with probabilities  $P_1 = 1/2$ ,  $P_2 = 1/4$ ,  $P_3 = 1/8$ ,  $P_4 = 1/16$ ,  $P_5 = P_6 = 1/32$ . Find entropy of the system. Also find the rate of information if there are 16 outcomes/sec.
- 3. Solve **any two** of the following:

 $(2 \times 6 = 12)$ 

- a) With the help of block diagram explain the DPCM system. Explain how the drawbacks of PCM system is overcome in DPCM system.
- b) Apply Shannon Fano coding procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 2.

[X] = [x1 x2 x3 x4 x5 x6 x7]

 $[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.081 \quad 0.04]$ 

c) Briefly explain the function of Scrambler and Unscrambler.

Set P



28

4. Answer any four of the following:

 $(4 \times 4 = 16)$ 

- a) Draw the block diagram of BPSK transmitter, obtain the equation for BPSK modulated signal.
- b) Explain what matched filter is.
- c) Write a note on M-ary orthogonal signals.
- d) Derive an expression for error probability of optimum filter.
- e) Explain the BFSK transmitter with neat block diagram.
- 5. Solve any two of the following:

 $(2 \times 6 = 12)$ 

- a) Explain how to minimize peak to average power ratio in multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Explain with neat phasor diagram and block diagram M-ary coherent PSK.

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# T.E. (E&TC) (Part – I) Examination, 2016

	PRIN	New) ICIPLES OF DIG	CGPA) ITAL CO		TION
•		sday, 30-11-2016			Max. Marks : 70
li		2) Answer MCQ/Ob	age No. 3 jective ty ention, Q	. <b>Each</b> question pe questions .P. Set (P/Q/R/	n carries <b>one</b> mark.
		MCQ/Objective	e Type Qı	uestions	
	: 30 Minutes				Marks : 14
	ose the correct				
1) .	mos	t affected by noise.			
	a) PSK	b) ASK	c) FS	SK (	d) DPSK
,	In a continuous signal is	wave modulation sche	eme the in	put signal is	and transmitted
	a) analog, ana	llog	b) dig	gital, analog	
	c) digital, digit	al	d) an	alog, digital	
3)	In a QAM both	identities are varied			
	a) amplitude a	nd phase	b) fre	quency and ph	ase
	c) bit rate and	phase	d) ba	ud rate and pha	ase
4)	The noise imm	unity of 16 QASK is _	1	than 16 PSK.	
	a) Less				d) None
, I	is an optimum cusing rectanguinconsistent?		channel no	rise is white and the following st	bits are transmitted attement would be
	<ul><li>a) a correlation</li></ul>		,	atched filter rec	
	c) an integrate	and dump receiver	d) sa	mple, hold and	dump receiver
6)	Costas loop is	a method for			
	a) Frame sync	hronization	b) Ca	arrier synchroni	zation
	c) Symbol syn	chronization	d) No	one of these	



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7)	Multichannel signal tra		nonly used on time va	arying channels to
	a) attenuation	t	o) amplification	
	c) phase shift	(	d) signal fading	
8)	The entropy of a mess 0.25, 0.125, 0.125 is	age source genera	ting four messages w	ith probability 0.5,
	a) 1 bit/message		o) 1.75 bit/message	
	c) 3.32 bit/message	(	d) 5.93 bit/message	
9)	The baud rate when use a) always equal to the b) equal to twice the b c) not equal to the sig	e bit rate pandwidth of an ide		
	d) equal to one half of	•	deal channel	
10)	The circuit required to a) a simple integrator c) a sample and hold	circuit t	pped PAM signal is b) a differentiator circ d) none of these	uit
11)	In a DM system, the gr a) increases rapidly b) remains constant c) decreases rapidly d) nature of modulating	, ,		
12)	The quantizer in the PC a) converting analog s b) converting the N bit c) rounding off each s d) none of the above	CM transmitter is us signal into N bit dig t parallel word into	sed for ital word a serial output	
13)	In an eye pattern open	ing of eye indicates	3	
	a) ISI increases	ŀ	) ISI decreases	
	c) Timing jitter increas	ses (	d) Timing jitter decrea	ases
14)	Which encoding method	od uses alternating	positive and negative	e values for 1's ?
,	_	_		) AMI



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# T.E. (E&TC) (Part – I) Examination, 2016 (New CGPA) PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date: Wednesday, 30-11-2016

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION – I 28

2. Answer any four of the following:

 $(4 \times 4 = 16)$ 

Marks: 56

- a) With the help of block diagram explain the working of Adaptive Delta Modulation.
- b) Explain M-ary signaling schemes. What are the advantages of M-ary signaling scheme over Binary signaling scheme?
- c) With the circuit diagram explain a PPM modulator and demodulator.
- d) What is the significance of eye diagram? Explain.
- e) An events has 6 possible outcomes with probabilities  $P_1 = 1/2$ ,  $P_2 = 1/4$ ,  $P_3 = 1/8$ ,  $P_4 = 1/16$ ,  $P_5 = P_6 = 1/32$ . Find entropy of the system. Also find the rate of information if there are 16 outcomes/sec.
- 3. Solve **any two** of the following:

 $(2 \times 6 = 12)$ 

- a) With the help of block diagram explain the DPCM system. Explain how the drawbacks of PCM system is overcome in DPCM system.
- b) Apply Shannon Fano coding procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 2.

[X] = [x1 x2 x3 x4 x5 x6 x7]

 $[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.081 \quad 0.04]$ 

c) Briefly explain the function of Scrambler and Unscrambler.

Set Q



28

4. Answer any four of the following:

 $(4 \times 4 = 16)$ 

- a) Draw the block diagram of BPSK transmitter, obtain the equation for BPSK modulated signal.
- b) Explain what matched filter is.
- c) Write a note on M-ary orthogonal signals.
- d) Derive an expression for error probability of optimum filter.
- e) Explain the BFSK transmitter with neat block diagram.
- 5. Solve any two of the following:

 $(2 \times 6 = 12)$ 

- a) Explain how to minimize peak to average power ratio in multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Explain with neat phasor diagram and block diagram M-ary coherent PSK.

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# T.E. (E&TC) (Part – I) Examination, 2016 (New CGPA) PRINCIPLES OF DIGITAL COMMUNICATION

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•	d Date : Wedne 0.00 a.m. to 1.0	sday, 30-11-2016 00 p.m.			Max. Marks: 70
1	Instructions :	2) Answer MCQ	k Page No. 3. I Objective typo o mention, Q.F	E <b>ach</b> question o e questions or P. Set (P/Q/R/S)	n first 30 minutes carries one mark. n Page No. 3 only. ) on Top of Page.
D	00 Min 1	MCQ/Obje	ctive Type Que	stions	M. J. 44
	n: 30 Minutes				Marks: 14
_	oose the correc			_	
1)	<ul><li>a) converting</li><li>b) converting</li></ul>	r in the PCM trans analog signal into the N bit parallel w ff each sample val above	N bit digital wo ord into a seria	rd Il output	Э
2)	In an eye patte	ern opening of eye	indicates		
	a) ISI increas	es	b) ISI d	decreases	
	c) Timing jitte	r increases	d) Timi	ing jitter decrea	ses
3)	Which encodir	ng method uses al	ernating positiv	e and negative	values for 1's ?
	a) NRZ-1	b) RZ	c) Mar	nchester d)	AMI
4)	mos	st affected by noise	<b>)</b> .		
·	a) PSK			d)	DPSK
5)	In a continuous signal is	s wave modulation	scheme the inpu	ut signal is	_ and transmitted
	a) analog, an	alog	b) digit	al, analog	
	c) digital, digi	tal	d) anal	log, digital	
6)	In a QAM both	identities are vari	ed		
	a) amplitude	and phase	b) freq	uency and phas	se
	c) bit rate and	l phase	d) bau	d rate and phas	se



7)	The noise immunity of 16 QASK is		than 16 PSK.	
	a) Less b) High	c)	Equal	d) None
8)	If in a particular digital communication s is an optimum coherent receiver, the cha using rectangular pulses then which of inconsistent? The receiver is	inne	l noise is white an	d bits are transmitted
	a) a correlation receiver	b)	matched filter re	ceiver
	c) an integrate and dump receiver	d)	sample, hold an	d dump receiver
9)	Costas loop is a method for			
	a) Frame synchronization	b)	Carrier synchron	nization
	c) Symbol synchronization	d)	None of these	
10)	Multichannel signal transmission is con overcome the effects of	nmo	nly used on time	varying channels to
	a) attenuation	b)	amplification	
	c) phase shift	d)	signal fading	
11)	The entropy of a message source gene 0.25, 0.125, 0.125 is	ratir	ng four messages	s with probability 0.5,
	a) 1 bit/message	b)	1.75 bit/message	е
	c) 3.32 bit/message	d)	5.93 bit/message	е
12)	The baud rate when using binary trans	miss	sion is	
	a) always equal to the bit rate	مامم	l abannal	
	<ul><li>b) equal to twice the bandwidth of an i</li><li>c) not equal to the signaling rate</li></ul>	uea	Channel	
	d) equal to one half of the bandwidth of	of ide	eal channel	
13)	The circuit required to generate the flat			S
ŕ	a) a simple integrator circuit	b)	a differentiator c	ircuit
	c) a sample and hold circuit	d)	none of these	
14)	In a DM system, the granular (idling) not a) increases rapidly	oise	occurs when the	modulating signal
	b) remains constant			
	c) decreases rapidly	hina	to do with this po	nico
	d) nature of modulating signal has not	mıy	to do with this fit	JISE .



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### T.E. (E&TC) (Part – I) Examination, 2016 (New CGPA) PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date: Wednesday, 30-11-2016

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION – I 28

2. Answer any four of the following:

 $(4 \times 4 = 16)$ 

Marks: 56

- a) With the help of block diagram explain the working of Adaptive Delta Modulation.
- b) Explain M-ary signaling schemes. What are the advantages of M-ary signaling scheme over Binary signaling scheme?
- c) With the circuit diagram explain a PPM modulator and demodulator.
- d) What is the significance of eye diagram? Explain.
- e) An events has 6 possible outcomes with probabilities  $P_1 = 1/2$ ,  $P_2 = 1/4$ ,  $P_3 = 1/8$ ,  $P_4 = 1/16$ ,  $P_5 = P_6 = 1/32$ . Find entropy of the system. Also find the rate of information if there are 16 outcomes/sec.
- 3. Solve **any two** of the following:

 $(2\times6=12)$ 

- a) With the help of block diagram explain the DPCM system. Explain how the drawbacks of PCM system is overcome in DPCM system.
- b) Apply Shannon Fano coding procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 2.

[X] = [x1 x2 x3 x4 x5 x6 x7]

 $[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.081 \quad 0.04]$ 

c) Briefly explain the function of Scrambler and Unscrambler.

Set R



28

4. Answer any four of the following:

 $(4 \times 4 = 16)$ 

- a) Draw the block diagram of BPSK transmitter, obtain the equation for BPSK modulated signal.
- b) Explain what matched filter is.
- c) Write a note on M-ary orthogonal signals.
- d) Derive an expression for error probability of optimum filter.
- e) Explain the BFSK transmitter with neat block diagram.
- 5. Solve any two of the following:

 $(2 \times 6 = 12)$ 

- a) Explain how to minimize peak to average power ratio in multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Explain with neat phasor diagram and block diagram M-ary coherent PSK.

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# T.E. (E&TC) (Part – I) Examination, 2016

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PRI	INCIPLES OF DIGIT	AL	COMMUNICA	IION
Day and Date : Wednesday, 30-11-2016 Time : 10.00 a.m. to 1.00 p.m.				Max. Marks: 70
Instructions :	<ol> <li>Q. No. 1 is compuls in Answer Book Pag</li> <li>Answer MCQ/Obje Don't forget to men</li> <li>Assume suitable da</li> </ol>	ge No ctive ntion	o. 3. Each questions type questions , Q.P. Set (P/Q/R	n carries <b>one</b> mark.
Duration : 20 Minutes	MCQ/Objective	Туре	Questions	Mayle : 14
Duration : 30 Minutes				Marks : 14
Choose the corre	ct answer :			
1) In a QAM bot	h identities are varied			
a) amplitude	and phase	b)	frequency and p	hase
c) bit rate an	d phase	d)	baud rate and ph	nase
2) The noise imr	munity of 16 QASK is		than 16 PSK.	
a) Less	b) High	c)	Equal	d) None
is an optimum using rectang	ar digital communication coherent receiver, the chapular pulses then which The receiver is	anne	noise is white and	d bits are transmitted
a) a correlati	on receiver	b)	matched filter red	ceiver
c) an integra	te and dump receiver	d)	sample, hold and	d dump receiver
4) Costas loop is	s a method for			
a) Frame syr	nchronization	b)	Carrier synchron	nization
c) Symbol sy	nchronization	d)	None of these	
5) Multichannel overcome the	signal transmission is co effects of	mmo	nly used on time	varying channels to
a) attenuatio	n	b)	amplification	
c) phase shif	't	d)	signal fading	

a) analog, analog

c) digital, digital

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6)	The entropy of a message source ger 0.25, 0.125, 0.125 is	neratii	ng four messages	s wit	th probability 0.5,
	a) 1 bit/message	b)	1.75 bit/messag	е	
	c) 3.32 bit/message	d)	5.93 bit/messag	е	
7)	The baud rate when using binary trana) always equal to the bit rate				
	<ul><li>b) equal to twice the bandwidth of ar</li><li>c) not equal to the signaling rate</li><li>d) equal to one half of the bandwidth</li></ul>				
8)	The circuit required to generate the fla			S	
,	a) a simple integrator circuit	•	a differentiator c		iit
	c) a sample and hold circuit	d)	none of these		
9)	In a DM system, the granular (idling)	noise	occurs when the	mo	dulating signal
	<ul><li>a) increases rapidly</li><li>b) remains constant</li></ul>				
	c) decreases rapidly				
	d) nature of modulating signal has no	othing	to do with this no	oise	<b>)</b>
(0)	The quantizer in the PCM transmitter				
,	a) converting analog signal into N bit				
	b) converting the N bit parallel word i	nto a	serial output		
	c) rounding off each sample value of	its ne	earest standard v	alue	9
	d) none of the above				
1)	In an eye pattern opening of eye indic	ates			
	a) ISI increases	b)	ISI decreases		
	c) Timing jitter increases	d)	Timing jitter dec	rea	ses
12)	Which encoding method uses alterna	ting p	ositive and negat	tive	values for 1's?
	a) NRZ-1 b) RZ	c)	Manchester	d)	AMI
(3)	most affected by noise.				
,	a) PSK b) ASK	c)	FSK	d)	DPSK
14)	In a continuous wave modulation sche signal is	me th	e input signal is _		_ and transmitted

b) digital, analog

d) analog, digital



Seat	
No.	

### T.E. (E&TC) (Part – I) Examination, 2016 (New CGPA) PRINCIPLES OF DIGITAL COMMUNICATION

Day and Date: Wednesday, 30-11-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION – I 28

2. Answer any four of the following:

 $(4 \times 4 = 16)$ 

- a) With the help of block diagram explain the working of Adaptive Delta Modulation.
- b) Explain M-ary signaling schemes. What are the advantages of M-ary signaling scheme over Binary signaling scheme?
- c) With the circuit diagram explain a PPM modulator and demodulator.
- d) What is the significance of eye diagram? Explain.
- e) An events has 6 possible outcomes with probabilities  $P_1 = 1/2$ ,  $P_2 = 1/4$ ,  $P_3 = 1/8$ ,  $P_4 = 1/16$ ,  $P_5 = P_6 = 1/32$ . Find entropy of the system. Also find the rate of information if there are 16 outcomes/sec.
- 3. Solve **any two** of the following:

 $(2\times6=12)$ 

- a) With the help of block diagram explain the DPCM system. Explain how the drawbacks of PCM system is overcome in DPCM system.
- b) Apply Shannon Fano coding procedure for following message ensemble. Also calculate average length of code and its efficiency. Assume M = 2.

[X] = [x1 x2 x3 x4 x5 x6 x7]

 $[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.081 \quad 0.04]$ 

c) Briefly explain the function of Scrambler and Unscrambler.

Set S



28

4. Answer any four of the following:

 $(4 \times 4 = 16)$ 

- a) Draw the block diagram of BPSK transmitter, obtain the equation for BPSK modulated signal.
- b) Explain what matched filter is.
- c) Write a note on M-ary orthogonal signals.
- d) Derive an expression for error probability of optimum filter.
- e) Explain the BFSK transmitter with neat block diagram.
- 5. Solve any two of the following:

 $(2 \times 6 = 12)$ 

- a) Explain how to minimize peak to average power ratio in multicarrier system.
- b) What are different symbol synchronization methods? Explain DTTL method in detail.
- c) Explain with neat phasor diagram and block diagram M-ary coherent PSK.

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# T.E. (E & TC) (Part – I) (New-CGPA) Examination, 2016 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date: Friday, 2-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

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

#### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

 $(14 \times 1 = 14)$ 

- 1) Component testing is a responsibility of
  - a) System test team

b) Component developer

c) Test manager

- d) Customer
- 2) Test automation helps to
  - a) Reduce the cost of testing
  - b) Increase the cost of testing
  - c) Reduce time of testing
  - d) Increase time of testing
- 3) Context model is concerned with
  - a) System model
  - b) Arrangement of elements around some entity
  - c) Process model
  - d) All of the above
- 4) "v" model gives stress on
  - a) Maintenance of system
- b) Testing of system
- c) Validation of system
- d) Both b) and c)
- 5) Functional requirement includes
  - a) I/p to system

b) O/p of system

c) I/p and o/p

d) Security of system



6)	Requirement document is prepared <ul><li>a) Manager</li><li>c) System test engineer</li></ul>			with respect to b) Customer d) All of the above				
7)	The fundamental neal Software process c) Software reuse		e engineering does not account for b) Software security d) Software validation					
8)	The base line budg a) Activity network c) Proposed plan		,	Cost monitoring	)			
9)	In an activity on arr a) Link	ow network, which b) Loop		below have dura Node		n ? All		
10)	is carried and a) Backward pass	•				ch each activity None		
11)	The Gantt chart is a) Tracking project b) Knowing date of c) Knowing starting d) Knowing end da	t progress f project g date of project						
12)	In network model for a) Full	ormulation hammo b) Half		activities require Zero		One and half		
13)	From program mar common objective a) Strategic progra c) Innovative	•	b)	tfolio of all projed Business cycle R & D	ct c	ontribute to a		
14)	One of the objectiva) Planning	es of activity planr b) Estimation			d)	None		



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# T.E. (E & TC) (Part – I) (New-CGPA) Examination, 2016 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date: Friday, 2-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION - I

2. Solve any three:

 $(3 \times 4 = 12)$ 

- a) Explain software validation.
- b) Write note on "Rational Unified Process".
- c) Prepare "Software Test Case Design Document".
- d) Explain test automation in detail.

3. Solve any two:

 $(8 \times 2 = 16)$ 

- a) Explain software life cycle using prototyping.
- b) List system models and explain any one of them.
- c) Compare V model with waterfall process model with diagram.

#### SECTION - II

#### 4. Solve any four (3.5 marks each):

- 1) Explain portfolio management for a business case.
- 2) What is change control, explain change control procedures.
- 3) Write note on risk identification.
- 4) Explain cost monitoring with cumulative expenditure chart.
- 5) Write note on assessment.

# 5. Solve any two (7 marks each):

- 1) Explain forward path and backward path with example, from example identify critical path.
- 2) Explain project progress using the Gantt chart and slip chart, explain disadvantages of chart.
- 3) Write step wise project planning activates.

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S	OF	•	C) (Part – I) (New- IEERING AND PI SEPI)	RO	JEĆT MANA		•	TEM
•		d Date : Friday, 2- 10.00 a.m. to 1.00					Max. Ma	ırks : 70
		2)	Q. No. 1 is compos 30 minutes in Answarries one mark. Answer MCQ/Object Don't forget to men	ver tiv	Book Page Network	'o. <b>3</b> . <b>ns o</b> i	<b>Each</b> ques n <b>Page No</b> . 3	tion F <b>only</b> .
Dur	otio	n : 20 Minutos	MCQ/Objective T	ype	Questions		Ma	vrlco i 1 4
Dura	atio	n : 30 Minutes					IVIE	ırks : 14
1.	Ch	oose the correct a	nswer:				(14	4×1=14)
	1)	<ul><li>The base line but</li><li>a) Activity netwo</li><li>c) Proposed plan</li></ul>	rk	,	Cost monitorin	ng		
	2)	In an activity on a a) Link	ırrow network, which b) Loop		below have du Node		n ? All	
	3)	may be started ar	rried out to calculate nd completed. s b) Forward pass				ch each acti None	vity
	4)	The Gantt chart is a) Tracking project b) Knowing date c) Knowing start d) Knowing end	ect progress of project ing date of project					
	5)	In network model a) Full	formulation hammo b) Half		activities requir Zero		One and ha	.lf
	6)	From program macommon objective a) Strategic prog c) Innovative		b)	tfolio of all proj Business cycl R & D		ontribute to	a



7)	One of the objective a) Planning		_	is Co-ordination	d)	None
8)	Component testing a) System test tea c) Test manager	•	b)	Component dev	/elo	per
9)	Test automation he a) Reduce the cos b) Increase the co c) Reduce time of d) Increase time of	t of testing st of testing testing				
10)	Context model is can a) System model b) Arrangement of c) Process model d) All of the above	elements around s	som	ne entity		
11)	"v" model gives str a) Maintenance of c) Validation of sy	system		Testing of syste Both b) and c)	em	
12)	Functional requirer a) I/p to system c) I/p and o/p	nent includes	,	O/p of system Security of sys	tem	ı
13)	Requirement docu a) Manager c) System test eng		b)	respect to Customer All of the above	)	
14)	The fundamental n a) Software proce c) Software reuse		b)	ineering does no Software secur Software valida ——	ity	



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# T.E. (E & TC) (Part – I) (New-CGPA) Examination, 2016 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date: Friday, 2-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION-I

2. Solve any three:

 $(3\times 4=12)$ 

- a) Explain software validation.
- b) Write note on "Rational Unified Process".
- c) Prepare "Software Test Case Design Document".
- d) Explain test automation in detail.

3. Solve any two:

 $(8 \times 2 = 16)$ 

- a) Explain software life cycle using prototyping.
- b) List system models and explain any one of them.
- c) Compare V model with waterfall process model with diagram.

#### SECTION - II

#### 4. Solve any four (3.5 marks each):

- 1) Explain portfolio management for a business case.
- 2) What is change control, explain change control procedures.
- 3) Write note on risk identification.
- 4) Explain cost monitoring with cumulative expenditure chart.
- 5) Write note on assessment.

# 5. Solve any two (7 marks each):

- 1) Explain forward path and backward path with example, from example identify critical path.
- 2) Explain project progress using the Gantt chart and slip chart, explain disadvantages of chart.
- 3) Write step wise project planning activates.

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SOI	T.E. (E & TO		•	JEĆT MAI	•	
Day ar	nd Date : Friday, 2-	12-2016			Ma	ax. Marks: 70
Time :	10.00 a.m. to 1.00	0 p.m.				
	Instructions: 1)	Q. No. 1 is a 30 minutes in carries one manager MCQ Don't forget to	n Answer nark. V <b>Objectiv</b>	Book Page e type ques	No. 3. Each	question  No. 3 only.
Duration	on : 30 Minutes	MCQ/Object	ctive Type	Questions		Marks : 14
1. Cł	noose the correct a	answer:				(14×1=14)
1)	) Functional requir	ement include	S			
	a) I/p to system		b)	O/p of syst	em	
	c) I/p and o/p		d)	Security of	system	
2)	) Requirement dod	cument is prep	ared with	respect to		
	a) Manager		b)	Customer		
	c) System test e	ngineer	d)	All of the al	oove	
3)	) The fundamenta	I notions of sof	_	_		for
	a) Software prod		,	Software se	•	
	c) Software reus			Software va	alidation	
4)	) The base line bu	_				
	a) Activity netwo		•	Cost monito	oring	
_,	c) Proposed plar		,	None		
5)	) In an activity on a					
	a) Link	b) Loop	•	Node	d) All	
6)		rried out to cal		latest dates	s on which eac	ch activity
	may be started a	na completed.				

a) Backward pass b) Forward pass c) End pass

d) None



7)	The Gantt chart is used for  a) Tracking project progress b) Knowing date of project c) Knowing starting date of project d) Knowing end date of project	
8)	In network model formulation hammo a) Full b) Half	ck activities required c) Zero d) One and half
9)	From program management where a common objective  a) Strategic programme	portfolio of all project contribute to a b) Business cycle
	c) Innovative	d) R&D
10)	One of the objectives of activity plans	ning is
ŕ	a) Planning b) Estimation	c) Co-ordination d) None
11)	Component testing is a responsibility a) System test team c) Test manager	of b) Component developer d) Customer
12)	Test automation helps to  a) Reduce the cost of testing b) Increase the cost of testing c) Reduce time of testing d) Increase time of testing	
13)	Context model is concerned with <ul><li>a) System model</li><li>b) Arrangement of elements around s</li><li>c) Process model</li><li>d) All of the above</li></ul>	some entity
14)	"v" model gives stress on a) Maintenance of system c) Validation of system	<ul><li>b) Testing of system</li><li>d) Both b) and c)</li></ul>



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# T.E. (E & TC) (Part – I) (New-CGPA) Examination, 2016 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date: Friday, 2-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION - I

2. Solve any three:

 $(3\times 4=12)$ 

- a) Explain software validation.
- b) Write note on "Rational Unified Process".
- c) Prepare "Software Test Case Design Document".
- d) Explain test automation in detail.

3. Solve any two:

 $(8 \times 2 = 16)$ 

- a) Explain software life cycle using prototyping.
- b) List system models and explain any one of them.
- c) Compare V model with waterfall process model with diagram.

#### SECTION - II

#### 4. Solve any four (3.5 marks each):

- 1) Explain portfolio management for a business case.
- 2) What is change control, explain change control procedures.
- 3) Write note on risk identification.
- 4) Explain cost monitoring with cumulative expenditure chart.
- 5) Write note on assessment.

### 5. Solve any two (7 marks each):

- 1) Explain forward path and backward path with example, from example identify critical path.
- 2) Explain project progress using the Gantt chart and slip chart, explain disadvantages of chart.
- 3) Write step wise project planning activates.

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T.E. (E & TC) (Part – I) (New-CGPA) Examination, 2016 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)							
•	nd Date : Friday, 2-1 10.00 a.m. to 1.00			Max. Marks: 70			
Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark. 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.							
Durotic	on : 30 Minutes	MCQ/Objective T	ype Questions	Marks : 14			
Duranc	on : 30 Minutes			Marks: 14			
1. Ch	noose the correct an	swer:		(14×1=14)			
1)	may be started and			which each activity d) None			
2)	The Gantt chart is  a) Tracking project b) Knowing date c c) Knowing startin d) Knowing end da	ct progress of project og date of project					
3)	In network model f a) Full	ormulation hammo b) Half	ck activities require c) Zero	ed d) One and half			
4)	From program mal common objective a) Strategic progra c) Innovative	-	portfolio of all proje b) Business cycle d) R & D				
5)	One of the objective a) Planning	ves of activity planr b) Estimation	ning is c) Co-ordination	d) None			

b) Component developer

d) Customer

6) Component testing is a responsibility of

a) System test team

c) Test manager



7)	Test automation help a) Reduce the cost of b) Increase the cost c) Reduce time of te d) Increase time of te	of testing of testing sting		
8)	Context model is concerned with  a) System model  b) Arrangement of elements around some entity c) Process model d) All of the above			
9)	"v" model gives stres a) Maintenance of sy c) Validation of syste	ystem b	Testing of syste     Both b) and c)	m
10)	Functional requirement a) I/p to system c) I/p and o/p	b	) O/p of system ) Security of syst	em
11)	Requirement docume a) Manager c) System test engin	b	n respect to  ) Customer  ) All of the above	
12)	The fundamental not a) Software process c) Software reuse	es b	gineering does no ) Software securi ) Software validat	ty
13)	The base line budget a) Activity network c) Proposed plan	b	) Cost monitoring ) None	
14)	In an activity on arrow a) Link			tion ? d) All



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# T.E. (E & TC) (Part – I) (New-CGPA) Examination, 2016 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT SYSTEM (SEPMS)

Day and Date: Friday, 2-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

#### SECTION - I

2. Solve any three:

 $(3 \times 4 = 12)$ 

- a) Explain software validation.
- b) Write note on "Rational Unified Process".
- c) Prepare "Software Test Case Design Document".
- d) Explain test automation in detail.

3. Solve any two:

 $(8 \times 2 = 16)$ 

- a) Explain software life cycle using prototyping.
- b) List system models and explain any one of them.
- c) Compare V model with waterfall process model with diagram.

#### SECTION - II

# 4. Solve any four (3.5 marks each):

- 1) Explain portfolio management for a business case.
- 2) What is change control, explain change control procedures.
- 3) Write note on risk identification.
- 4) Explain cost monitoring with cumulative expenditure chart.
- 5) Write note on assessment.

# 5. Solve any two (7 marks each):

- 1) Explain forward path and backward path with example, from example identify critical path.
- 2) Explain project progress using the Gantt chart and slip chart, explain disadvantages of chart.
- 3) Write step wise project planning activates.

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### T.E. (E & TC) (Part – I) (New CGPA) Examination, 2016 **DIGITAL SIGNAL PROCESSING**

Day and Date: Monday, 5-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) **All** questions are **compulsory**.
- 4) Figure to the **right** indicate **full** marks.
- 5) Assume suitable data if necessary.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 14

1. Choose the correct answer:

 $(1 \times 14 = 14)$ 

- 1) Let x1 (t) and x2 (t) be periodic signals with fundamental periods T1 and T2 respectively. Then the fundamental period of x(t) = x1(t) + x2(t) is
  - a) LCM of T1 and T2

b) Product of T1 and T2

c) HCF of T1 and T2

- d) Ratio of T1 to T2
- 2) If x(n) is a real sequence and X(k) is its N-point DFT, then which of the following is true?
  - a) X(N k) = X(-k)

b)  $X (N - k) = X^*(k)$ 

c)  $X (-k) = X^*(k)$ 

- d) All of the mentioned
- 3) If x1(n), x2(n) and x3(m) are three sequences each of length N whose DFTs are given as X1(k), X2(k) and X3(k) respectively and X3(k) = X1(k). X2(k), then what is the expression for x3(m)?

  - a)  $\sum_{n=0}^{N-1} x1(n).x2(m+n)$  b)  $\sum_{n=0}^{N-1} x1(n).x2(m-n)$
  - c)  $\sum_{n=0}^{N-1} x1(n).x2((m-n))_N$
- d)  $\sum_{n=0}^{N-1} x1(n).x2((m+n))_{N+1}$
- 4) Which of the following is true in case of overlap add method?
  - a) M zeros are appended at last of each data block
  - b) M zeros are appended at first of each data block
  - c) M-1 zeros are appended at last of each data block
  - d) M-1 zeros are appended at first of each data block
- 5) Which of the following is true regarding the number of computations required to compute an N-point DFT using FFT algorithms?
  - a)  $N^2$  complex multiplications and N(N-1) complex additions
  - b)  $N^2$  complex additions and N(N-1) complex multiplications
  - c)  $N^2$  complex multiplications and N(N + 1) complex additions
  - d)  $N^2$  complex additions and N(N + 1) complex multiplications



6)	$W_{N}^{k+N/2} =$	
	a) W N	b) - W <sup>k</sup> <sub>N</sub>
	c) $W_N^{-k}$	d) None of the mentioned
7)	Which of the following conditions made digit analog signal processing?	tal signal processing more advantageous over
	<ul><li>a) Time</li><li>c) Pressure</li></ul>	<ul><li>b) Spatial co-ordinates</li><li>d) None of the mentioned</li></ul>
8)	The disadvantage of FIR filter  a) FIR filter with exact linear phase can be b) FIR filter can be realized in both recurs c) FIR filters are free from limit cycle oscil d) Memory requirement and execution time	sive and non recursive structure llation
9)	FIR filter is always stable because a) All its poles are at origin c) $h(n) = h(N-1-n)$	<ul><li>b) All its zeros are at origin</li><li>d) None</li></ul>
10)	IIR filter design is based on filter of a) Analog b) Discrete time	=
11)	For impulse response of FIR filter to satisfy by	y for constant group delay, the phase is given
	a) $\theta(\mathbf{w}) = -\alpha \mathbf{w}$ b) $\theta(\mathbf{w}) = \alpha \mathbf{w}$	c) $\theta(w) = \beta - \alpha w$ d) $\theta(w) = 0$
12)	Butterworth filter have  a) constant response in pass band and do b) maximally flat response in pass band and band c) ripple in pass band and ripple in stop ba d) none	nd monotonically decreasing response in stop
13)	The advantage of cascade realization is a) Quantization error can be minimized b) Noise decreased c) Linear Phase d) None	
14)	Direct form II requires a) M+N+1 multiplication b) M+N addition	

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c) Maximum of (M, N) memory location

d) All of the above



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# T.E. (E & TC) (Part – I) (New CGPA) Examination, 2016 DIGITAL SIGNAL PROCESSING

Day and Date: Monday, 5-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) The first 5 point of the 8 point DFT of a real valued sequence are {0.25, 0.125 j0.3018, 0, 0.125 j0.0518, 0}. Determine the remaining three points.
- b) Find cross correlation of given DT sequences :  $x[n] = \{1, 2, 3, 4\}$  and  $h[n] = \{5, 0, 6\}$ .
- c) Explain Goertzel algorithm.
- d) Using transformation matrix, obtain X[k] if  $x[n] = \{1, 2, 3, 2\}$ .
- e) Perform circular convolution of  $x[n] = \{1, 2, 3, 4\}$  and  $y[n] = \{5, 6, 7\}$ .

3. Attempt any one of the following:

 $(1 \times 8 = 8)$ 

- a) Find linear convolution using overlap-Save method of the following sequences :  $X[n] = \{1, 2, 3, 4, 5, 6, 7\}$  and  $h[n] = \{1, 0, 2\}$ .
- b) Find x[n] using DIF FFT where  $X(k) = \{20, 0, -4 + j4, 0, -4, 0, -4 j4, 0\}$ .

4. Solve any four:

 $(4 \times 4 = 16)$ 

- a) Write a short note on Gibb's phenomenon.
- b) With block diagram explain FIR implementation technique.
- c) By impulse invariance method obtain the digital filter transfer function and the differential

equation of analog filter 
$$H(s) = \frac{1}{s+1}$$
.

- d) Obtain direct form I for system y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) Explain the application of DSP in audio processing in detail.



- 5. Solve any two: (6×2=12)
  - a) Using bilinear transformation obtain H(Z) if H (s) =  $\frac{s+0.1}{(s+0.1)^2+9}$  and T = 0.1 s.
  - b) Design an ideal high pass filter with a frequency response

$$H_d(e^{j(t)}) = 1$$
 for  $\pi \ge \omega \ge \frac{\pi}{3}$   
= 0 otherwise

Find the values of h(n) for N = 7 and H(Z) using Hanning window.

- c) Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{2}$ ;  $k_2 = \frac{1}{3}$ ;  $k_3 = \frac{1}{4}$ . Determine the FIR filter coefficients for direct form structure.
- d) Design an analog low pass Butterworh filter with pass band and stop band cut off frequencies 800 rad/sec and 1800 rad/sec. The pass band attenuation is 3 dB and stop band attenuation is 10 dB.

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# T.F. (F & TC) (Part – I) (New CGPA) Examination, 2016

DIGITAL SIGNA	L PROCESSING
Day and Date : Monday, 5-12-2016 Time : 10.00 a.m. to 1.00 p.m.	Max. Marks : 70
Answer Book Page N 2) <b>Answer MCQ/Object</b>	licate <b>full</b> marks.
MCQ/Objective	
Duration: 30 Minutes	Marks : 14
<ol> <li>Choose the correct answer :</li> <li>The disadvantage of FIR filter</li> </ol>	(1×14=14)
<ul> <li>a) FIR filter with exact linear phase can be</li> <li>b) FIR filter can be realized in both recur</li> <li>c) FIR filters are free from limit cycle osc</li> <li>d) Memory requirement and execution tin</li> </ul>	sive and non recursive structure illation
<ul><li>2) FIR filter is always stable because</li><li>a) All its poles are at origin</li><li>c) h(n) = h(N-1-n)</li></ul>	<ul><li>b) All its zeros are at origin</li><li>d) None</li></ul>
<ul><li>3) IIR filter design is based on filter</li><li>a) Analog</li><li>b) Discrete time</li></ul>	design. c) Digital d) None
4) For impulse response of FIR filter to satisf by a) $\theta(w) = -\alpha w$ b) $\theta(w) = \alpha w$	by for constant group delay, the phase is given $c(x) \theta(y) = \theta - \alpha y \qquad d(y) = 0$
<ul><li>5) Butterworth filter have</li><li>a) constant response in pass band and const</li></ul>	decreasing response in stop band and monotonically decreasing response in stop

6) The advantage of cascade realization is

- b) Noise decreased
- c) Linear Phase
- d) None

d) none



- 7) Direct form II requires
  - a) M+N+1 multiplication
  - b) M+N addition
  - c) Maximum of (M, N) memory location
  - d) All of the above
- 8) Let x1 (t) and x2 (t) be periodic signals with fundamental periods T1 and T2 respectively. Then the fundamental period of x (t) = x1 (t) + x2 (t) is
  - a) LCM of T1 and T2

b) Product of T1 and T2

c) HCF of T1 and T2

- d) Ratio of T1 to T2
- 9) If x(n) is a real sequence and X(k) is its N-point DFT, then which of the following is true?
  - a) X(N-k) = X(-k)

b)  $X (N - k) = X^*(k)$ 

c)  $X (-k) = X^*(k)$ 

- d) All of the mentioned
- 10) If x1(n), x2(n) and x3(m) are three sequences each of length N whose DFTs are given as X1(k), X2(k) and X3(k) respectively and X3(k) = X1(k). X2(k), then what is the expression for x3(m)?
  - a)  $\sum_{n=0}^{N-1} x1(n).x2(m+n)$
- b)  $\sum_{n=0}^{N-1} x1(n).x2(m-n)$
- c)  $\sum_{n=0}^{N-1} x1(n).x2((m-n))_N$
- d)  $\sum_{n=0}^{N-1} x1(n).x2((m+n))_{N+1}$
- 11) Which of the following is true in case of overlap add method?
  - a) M zeros are appended at last of each data block
  - b) M zeros are appended at first of each data block
  - c) M-1 zeros are appended at last of each data block
  - d) M-1 zeros are appended at first of each data block
- 12) Which of the following is true regarding the number of computations required to compute an N-point DFT using FFT algorithms?
  - a)  $N^2$  complex multiplications and N(N-1) complex additions
  - b)  $N^2$  complex additions and N(N-1) complex multiplications
  - c)  $N^2$  complex multiplications and N(N + 1) complex additions
  - d) N<sup>2</sup> complex additions and N(N + 1) complex multiplications
- 13)  $W_N^{k+N/2} =$ 
  - a)  $W_N^k$

b)  $- W_N^k$ 

c)  $W_N^{-k}$ 

- d) None of the mentioned
- 14) Which of the following conditions made digital signal processing more advantageous over analog signal processing?
  - a) Time

b) Spatial co-ordinates

c) Pressure

d) None of the mentioned



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# T.E. (E & TC) (Part – I) (New CGPA) Examination, 2016 DIGITAL SIGNAL PROCESSING

Day and Date: Monday, 5-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) The first 5 point of the 8 point DFT of a real valued sequence are {0.25, 0.125 j0.3018, 0, 0.125 j0.0518, 0}. Determine the remaining three points.
- b) Find cross correlation of given DT sequences :  $x[n] = \{1, 2, 3, 4\}$  and  $h[n] = \{5, 0, 6\}$ .
- c) Explain Goertzel algorithm.
- d) Using transformation matrix, obtain X[k] if  $x[n] = \{1, 2, 3, 2\}$ .
- e) Perform circular convolution of  $x[n] = \{1, 2, 3, 4\}$  and  $y[n] = \{5, 6, 7\}$ .
- 3. Attempt any one of the following:

 $(1 \times 8 = 8)$ 

- a) Find linear convolution using overlap-Save method of the following sequences :  $X[n] = \{1, 2, 3, 4, 5, 6, 7\}$  and  $h[n] = \{1, 0, 2\}$ .
- b) Find x[n] using DIF FFT where  $X(k) = \{20, 0, -4 + j4, 0, -4, 0, -4 j4, 0\}$ .

#### SECTION - II

4. Solve any four:

 $(4 \times 4 = 16)$ 

- a) Write a short note on Gibb's phenomenon.
- b) With block diagram explain FIR implementation technique.
- c) By impulse invariance method obtain the digital filter transfer function and the differential

equation of analog filter 
$$H(s) = \frac{1}{s+1}$$
.

- d) Obtain direct form I for system y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) Explain the application of DSP in audio processing in detail.



- 5. Solve any two: (6×2=12)
  - a) Using bilinear transformation obtain H(Z) if H (s) =  $\frac{s+0.1}{(s+0.1)^2+9}$  and T = 0.1 s.
  - b) Design an ideal high pass filter with a frequency response

$$H_d(e^{j(\Omega)}) = 1$$
 for  $\pi \ge \omega \ge \frac{\pi}{3}$   
= 0 otherwise

Find the values of h(n) for N = 7 and H(Z) using Hanning window.

- c) Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{2}$ ;  $k_2 = \frac{1}{3}$ ;  $k_3 = \frac{1}{4}$ . Determine the FIR filter coefficients for direct form structure.
- d) Design an analog low pass Butterworh filter with pass band and stop band cut off frequencies 800 rad/sec and 1800 rad/sec. The pass band attenuation is 3 dB and stop band attenuation is 10 dB.

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	-	GITAL SIGNAL		PA) Examination OCESSING	, 2016	
Day and Date : Mo Time : 10.00 a.m. to	•	6			Max	. Marks : 70
Instructi	Answ 2) <b>Ansv</b> <b>forge</b> 3) <b>All</b> qu 4) Figur	ver Book Page No v <b>er MCQ/Objecti</b>	o. 3. ve t P. S puls cate	full marks.	ies <b>one</b> mark. <b>Page No. 3 or</b>	
	ľ	MCQ/Objective T	ype	Questions		
Duration: 30 Minut	tes					Marks: 14
1. Choose the co	orrect answer :					(1×14=14)
compute a) N <sup>2</sup> co b) N <sup>2</sup> co c) N <sup>2</sup> co	an N-point DFT mplex multiplica mplex additions mplex multiplica	rue regarding the using FFT algoritations and N(N – 1) corations and N(N + 1) corand N(N + 1) corand N(N + 1) cor	hms 1) cc nple 1) cc	mplex additions x multiplications mplex additions	s required to	
2) W N N	=					
a) W N			b)	– W N		
c) W $_{N}^{-k}$			d)	None of the mentio	ned	
•	gnal processing	_	b)	gnal processing mor Spatial co-ordinate None of the mentio	es	us over
a) FIR fil b) FIR fil c) FIR fil	lter can be realiz Iters are free fro	near phase can be	ive a latio	and non recursive s	tructure	
a) All its	is always stable poles are at oriç - h(N–1–n)		,	All its zeros are at None	origin	
6) IIR filter d a) Analo	_	on filter o			d) None	



- 7) For impulse response of FIR filter to satisfy for constant group delay, the phase is given by
  - a)  $\theta(\mathbf{w}) = -\alpha \mathbf{w}$
- b)  $\theta(w) = \alpha w$  c)  $\theta(w) = \beta \alpha w$  d)  $\theta(w) = 0$

- 8) Butterworth filter have
  - a) constant response in pass band and decreasing response in stop band
  - b) maximally flat response in pass band and monotonically decreasing response in stop band
  - c) ripple in pass band and ripple in stop band
  - d) none
- 9) The advantage of cascade realization is
  - a) Quantization error can be minimized
  - b) Noise decreased
  - c) Linear Phase
  - d) None
- 10) Direct form II requires
  - a) M+N+1 multiplication
  - b) M+N addition
  - c) Maximum of (M, N) memory location
  - d) All of the above
- 11) Let x1 (t) and x2 (t) be periodic signals with fundamental periods T1 and T2 respectively. Then the fundamental period of x(t) = x1(t) + x2(t) is
  - a) LCM of T1 and T2

b) Product of T1 and T2

c) HCF of T1 and T2

- d) Ratio of T1 to T2
- 12) If x(n) is a real sequence and X(k) is its N-point DFT, then which of the following is true?
  - a) X(N k) = X(-k)

b)  $X (N - k) = X^*(k)$ 

c)  $X (-k) = X^*(k)$ 

- d) All of the mentioned
- 13) If x1(n), x2(n) and x3(m) are three sequences each of length N whose DFTs are given as X1(k), X2(k) and X3(k) respectively and X3(k) = X1(k). X2(k), then what is the expression for x3(m)?
  - a)  $\sum_{n=0}^{N-1} x1(n).x2(m+n)$
- b)  $\sum_{n=0}^{N-1} x1(n).x2(m-n)$
- c)  $\sum_{n=0}^{N-1} x1(n).x2((m-n))_N$
- d)  $\sum_{n=0}^{N-1} x1(n).x2((m+n))_{N+1}$
- 14) Which of the following is true in case of overlap add method?
  - a) M zeros are appended at last of each data block
  - b) M zeros are appended at first of each data block
  - c) M-1 zeros are appended at last of each data block
  - d) M-1 zeros are appended at first of each data block



Seat	
No.	

# T.E. (E & TC) (Part – I) (New CGPA) Examination, 2016 DIGITAL SIGNAL PROCESSING

Day and Date: Monday, 5-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) The first 5 point of the 8 point DFT of a real valued sequence are {0.25, 0.125 j0.3018, 0, 0.125 j0.0518, 0}. Determine the remaining three points.
- b) Find cross correlation of given DT sequences :  $x[n] = \{1, 2, 3, 4\}$  and  $h[n] = \{5, 0, 6\}$ .
- c) Explain Goertzel algorithm.
- d) Using transformation matrix, obtain X[k] if  $x[n] = \{1, 2, 3, 2\}$ .
- e) Perform circular convolution of  $x[n] = \{1, 2, 3, 4\}$  and  $y[n] = \{5, 6, 7\}$ .

3. Attempt any one of the following:

 $(1 \times 8 = 8)$ 

- a) Find linear convolution using overlap-Save method of the following sequences :  $X[n] = \{1, 2, 3, 4, 5, 6, 7\}$  and  $h[n] = \{1, 0, 2\}$ .
- b) Find x[n] using DIF FFT where  $X(k) = \{20, 0, -4 + j4, 0, -4, 0, -4 j4, 0\}$ .

4. Solve any four:

 $(4 \times 4 = 16)$ 

- a) Write a short note on Gibb's phenomenon.
- b) With block diagram explain FIR implementation technique.
- c) By impulse invariance method obtain the digital filter transfer function and the differential

equation of analog filter 
$$H(s) = \frac{1}{s+1}$$
.

- d) Obtain direct form I for system y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) Explain the application of DSP in audio processing in detail.



- 5. Solve any two: (6×2=12)
  - a) Using bilinear transformation obtain H(Z) if H (s) =  $\frac{s+0.1}{(s+0.1)^2+9}$  and T = 0.1 s.
  - b) Design an ideal high pass filter with a frequency response

$$H_d(e^{j(\Omega)}) = 1$$
 for  $\pi \ge \omega \ge \frac{\pi}{3}$   
= 0 otherwise

Find the values of h(n) for N = 7 and H(Z) using Hanning window.

- c) Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{2}$ ;  $k_2 = \frac{1}{3}$ ;  $k_3 = \frac{1}{4}$ . Determine the FIR filter coefficients for direct form structure.
- d) Design an analog low pass Butterworh filter with pass band and stop band cut off frequencies 800 rad/sec and 1800 rad/sec. The pass band attenuation is 3 dB and stop band attenuation is 10 dB.

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# T.E. (E & TC) (Part – I) (New CGPA) Examination, 2016 DIGITAL SIGNAL PROCESSING

		<b>DIGITAL SIGNA</b>	L PROCESSING	
•	Date: Monday, 5-12-2 0.00 a.m. to 1.00 p.m.	016		Max. Marks : 70
	An 2) <b>Ar</b> <b>fo</b> 3) <b>Al</b> 4) Fig	nswer Book Page N <b>nswer MCQ/Objec</b> t	to. 3. Each question of tive type questions of the type questions of the type of type of the type of type of the type of type of the type of the type of t	on Page No. 3 only. Don't
		MCQ/Objective	Type Questions	
Duration	: 30 Minutes			Marks: 14
	oose the correct answe			(1×14=14)
1)	IIR filter design is base a) Analog	ed on filter b) Discrete time	design. c) Digital	d) None
2)	For impulse response by	of FIR filter to satisf	fy for constant group of	delay, the phase is given
	a) $\theta(\mathbf{w}) = -\alpha \mathbf{w}$	b) $\theta(\mathbf{w}) = \alpha \mathbf{w}$	c) $\theta(\mathbf{w}) = \beta - \alpha \mathbf{v}$	$v d) \theta(w) = 0$
3)	Butterworth filter have a) constant response b) maximally flat response band c) ripple in pass band d) none	in pass band and o onse in pass band a	and monotonically dec	n stop band reasing response in stop
4)	The advantage of case a) Quantization error b) Noise decreased c) Linear Phase d) None			
5)	Direct form II requires a) M+N+1 multiplicati b) M+N addition c) Maximum of (M, N) d) All of the above	ion		
6)	Then the fundamental a) LCM of T1 and T2	period of $x(t) = x1$	(t) + x2 (t) is b) Product of T1 a	
	c) HCF of T1 and T2		d) Ratio of T1 to T	2



- 7) If x(n) is a real sequence and X(k) is its N-point DFT, then which of the following is true?
  - a) X(N-k) = X(-k)

b)  $X (N - k) = X^*(k)$ 

c)  $X (-k) = X^*(k)$ 

- d) All of the mentioned
- 8) If x1(n), x2(n) and x3(m) are three sequences each of length N whose DFTs are given as X1(k), X2(k) and X3(k) respectively and X3(k) = X1(k). X2(k), then what is the expression for x3(m)?
  - a)  $\sum_{n=0}^{N-1} x1(n).x2(m+n)$
- b)  $\sum_{n=0}^{N-1} x1(n).x2(m-n)$
- c)  $\sum_{n=0}^{N-1} x1(n).x2((m-n))_N$
- d)  $\sum_{n=0}^{N-1} x1(n).x2((m+n))_{N+1}$
- 9) Which of the following is true in case of overlap add method?
  - a) M zeros are appended at last of each data block
  - b) M zeros are appended at first of each data block
  - c) M-1 zeros are appended at last of each data block
  - d) M-1 zeros are appended at first of each data block
- 10) Which of the following is true regarding the number of computations required to compute an N-point DFT using FFT algorithms?
  - a)  $N^2$  complex multiplications and N(N-1) complex additions
  - b)  $N^2$  complex additions and N(N-1) complex multiplications
  - c) N<sup>2</sup> complex multiplications and N(N + 1) complex additions
  - d) N<sup>2</sup> complex additions and N(N + 1) complex multiplications
- 11)  $W_N^{k+N/2} =$ 
  - a)  $W_N^k$

b)  $-W_N^k$ 

c)  $W_N^{-k}$ 

- d) None of the mentioned
- 12) Which of the following conditions made digital signal processing more advantageous over analog signal processing?
  - a) Time

b) Spatial co-ordinates

c) Pressure

- d) None of the mentioned
- 13) The disadvantage of FIR filter
  - a) FIR filter with exact linear phase can be easily designed
  - b) FIR filter can be realized in both recursive and non recursive structure
  - c) FIR filters are free from limit cycle oscillation
  - d) Memory requirement and execution time are high
- 14) FIR filter is always stable because
  - a) All its poles are at origin
- b) All its zeros are at origin

c) h(n) = h(N-1-n)

d) None

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Seat	
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# T.E. (E & TC) (Part – I) (New CGPA) Examination, 2016 DIGITAL SIGNAL PROCESSING

Day and Date: Monday, 5-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) The first 5 point of the 8 point DFT of a real valued sequence are {0.25, 0.125 j0.3018, 0, 0.125 j0.0518, 0}. Determine the remaining three points.
- b) Find cross correlation of given DT sequences :  $x[n] = \{1, 2, 3, 4\}$  and  $h[n] = \{5, 0, 6\}$ .
- c) Explain Goertzel algorithm.
- d) Using transformation matrix, obtain X[k] if  $x[n] = \{1, 2, 3, 2\}$ .
- e) Perform circular convolution of  $x[n] = \{1, 2, 3, 4\}$  and  $y[n] = \{5, 6, 7\}$ .
- 3. Attempt any one of the following:

 $(1 \times 8 = 8)$ 

- a) Find linear convolution using overlap-Save method of the following sequences :  $X[n] = \{1, 2, 3, 4, 5, 6, 7\}$  and  $h[n] = \{1, 0, 2\}$ .
- b) Find x[n] using DIF FFT where  $X(k) = \{20, 0, -4 + j4, 0, -4, 0, -4 j4, 0\}$ .

#### SECTION - II

4. Solve any four:

 $(4 \times 4 = 16)$ 

- a) Write a short note on Gibb's phenomenon.
- b) With block diagram explain FIR implementation technique.
- c) By impulse invariance method obtain the digital filter transfer function and the differential

equation of analog filter 
$$H(s) = \frac{1}{s+1}$$
.

- d) Obtain direct form I for system y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)
- e) Explain the application of DSP in audio processing in detail.



- 5. Solve any two: (6×2=12)
  - a) Using bilinear transformation obtain H(Z) if H (s) =  $\frac{s+0.1}{(s+0.1)^2+9}$  and T = 0.1 s.
  - b) Design an ideal high pass filter with a frequency response

$$H_d(e^{j\omega}) = 1$$
 for  $\pi \ge \omega \ge \frac{\pi}{3}$   
= 0 otherwise

Find the values of h(n) for N = 7 and H(Z) using Hanning window.

- c) Consider an FIR lattice filter with coefficients  $k_1 = \frac{1}{2}$ ;  $k_2 = \frac{1}{3}$ ;  $k_3 = \frac{1}{4}$ . Determine the FIR filter coefficients for direct form structure.
- d) Design an analog low pass Butterworh filter with pass band and stop band cut off frequencies 800 rad/sec and 1800 rad/sec. The pass band attenuation is 3 dB and stop band attenuation is 10 dB.

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# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

- 2) Figures to the **right** indicate **full** marks.
- 3) Assume suitable data if necessary.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

1. Choose the correct answer:

14

- 1) Which microprocessor pins are used to request and acknowledge a DMA transfer?
  - a) Reset and Ready

b) Ready and INTR

c) HOLD and HLDA

- d) None of these
- 2) In memory mapped I/O; address width is
  - a) 8 bit
- b) 32 bit
- c) 16 bit
- d) 64 bit

- 3) RST 7.5 interrupt is
  - a) Level triggered

b) +ve edge triggered

c) –ve edge triggered

- d) Both a) and b)
- 4) The length of the instruction gueue in 8086 is
  - a) 4 byte
- b) 5 byte
- c) 6 byte
- d) 8 byte
- 5) If all the ports of 8255 used in output mode then the command word is
  - a) 80H
- b) 90H
- c) A0H
- d) B0H



6)	For generating squato load in counter o	•			oun	t value required
	a) (500) <sub>10</sub>	b) (800) <sub>10</sub>	c)	(900) <sub>10</sub>	d)	(1000) <sub>10</sub>
7)	The 8253 counter s	tarts counting only	/ if			
	a) GATE signal is I			GATE signal is	_	h
	c) CLK signal is lov	N	d)	CLK signal is hi	igh	
8)	8251 is a					
	a) UART					
	b) USART	ntorrunt controllor				
	<ul><li>c) Programmable I</li><li>d) Programmable i</li></ul>	· ·	bor			
0)	, 3			ring made 2 and	roti	ion of the POEE 2
9)	Which pins are gene a) PA0-PA7	erai purpose i/O piris		PB0-PB7	Hau	1011 01 trie 6255 ?
	c) PC4-PC7		,	PC0-PC3		
10)	ADC 0809 is of	tyne	<b>-</b> .,			
10)	a) Weighted registe		b)	Successive app	orox	ximation
	c) R-2R ladder		•	Dual slope		
11)	Control word forma	at required to initia	aliz	e 8251 in asyno	chro	nous mode for
,	baud rate factor 1x	•		•		
	a) 41 H	b) 51 H	c)	50 H	d)	40 H
12)	The number of flags	s present in 8086 a	ıre			
	a) 5	b) 8	c)	9	d)	13
13)	Tick mark the odd i	nstruction from the	e gi	ven		
	a) XCHG	b) RAL	c)	DAA	d)	ADD B
14)	Microprocessor ent	er into wait state w	vhe	n		
	a) Any interrupt sig	• •	,	Low signal on F	REA	DY pin
	c) High signal on R	EADY pin	d)	None of these		



Seat	
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# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

### 2. a) Solve any two:

10

- 1) Explain the XCHG, RST0 and JP 16 bit address instructions of 8085.
- 2) Write a assembly language program to identify the odd and even numbers from the array of 10 numbers. The even count store at a location 9000H and odd count store at location 9001H.
- 3) Draw the timing diagram for the instruction ADD B.
- b) Generate a control signals MEMR, MEMW, IOR and IOW by using the 3:8 decoder (74138).

3. Solve any two:

14

4

- 1) Interface  $2K \times 8$  EPROM memory to 8085. Give its initial and final address.
- 2) Explain the hardware interrupts of 8085.
- 3) Explain the Reset, HOLD and wait state of microprocessor 8085.

## 4. a) Solve any two:

10

- 1) Draw the PSW format and explain the flag registers of 8086.
- 2) Explain the Mode-1 of 8255.
- 3) Draw and explain R-2R Ladder type DAC.
- b) Draw the control word format of 8255 and determine the control word for the following:
  - 1) PA Input in mode 2 and PB in mode 1 as output port
  - 2) All ports are input except PCU.

4

Set P



### 5. Solve **any two**:

14

- 1) Draw an interfacing circuitry to interface 8253 with 8085 in I/O mapped I/O mode, so as to have 30 H is the counter 0 address. Explain Mode-3 of 8253.
- 2) Interface common anode type seven segment display with 8085. Write a ALP to display 0 to 9 on it.
- 3) Interface ADC 0809 with 8085 in I/O mapped I/O mode. Write a ALP to read a analog input applied to channel-3 and store the digital value at memory location 9000 H.


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# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

a) 41 H

Instructions: 1) All questions are compulsory.

b) 51 H

- 2) Figures to the **right** indicate **full** marks.
- 3) Assume suitable data if necessary.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

MCQ/Ob	jective Type Questions
Duration: 30 Minutes	Marks: 14
1. Choose the correct answer:	14
<ul><li>1) 8251 is a</li><li>a) UART</li><li>b) USART</li><li>c) Programmable Interrupt of</li><li>d) Programmable interval ting</li></ul>	
<ul><li>2) Which pins are general purpos</li><li>a) PA0-PA7</li><li>c) PC4-PC7</li></ul>	se I/O pins during mode-2 operation of the 8255? b) PB0-PB7 d) PC0-PC3
<ul><li>3) ADC 0809 is of</li><li>a) Weighted register</li><li>c) R-2R ladder</li></ul>	type. b) Successive approximation d) Dual slope
•	ed to initialize 8251 in asynchronous mode for er length 5 bits, no parity, 1 stop bit is

c) 50 H

d) 40 H



5)	The number of flags a) 5	s present in 8086 a b) 8	re c)	9	d)	13
6)	Tick mark the odd i a) XCHG	nstruction from the	•	ven DAA	۹)	ADD B
7)	Microprocessor en	ter into wait state w	, vhe	n	,	
	<ul><li>a) Any interrupt sig</li><li>c) High signal on F</li></ul>	• •	,	•	REA	DY pin
8)	Which microproces transfer?	ssor pins are used	l to	request and ac	knc	wledge a DMA
	a) Reset and Read c) HOLD and HLD	•	,	Ready and INTI None of these	7	
9)	In memory mapped	·				
	a) 8 bit	b) 32 bit	c)	16 bit	d)	64 bit
10)	RST 7.5 interrupt is	3				
	a) Level triggered	_	•	+ve edge trigge	red	
	c) –ve edge trigger	ed	d)	Both a) and b)		
11)	The length of the in	•				
	a) 4 byte	b) 5 byte	c)	6 byte	d)	8 byte
12)	If all the ports of 82	55 used in output r	no	de then the comi	mar	nd word is
	a) 80H	b) 90H	c)	A0H	d)	B0H
13)	For generating squ to load in counter o	•		•	oun	t value required
	a) (500) <sub>10</sub>	b) (800) <sub>10</sub>	c)	(900) <sub>10</sub>	d)	(1000) <sub>10</sub>
14)	The 8253 counter s	starts counting only	/ if			
	a) GATE signal is I		,	GATE signal is	_	h
	c) CLK signal is lo	N	d)	CLK signal is hi	gh	

Set Q



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# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

### 2. a) Solve any two:

10

- 1) Explain the XCHG, RST0 and JP 16 bit address instructions of 8085.
- 2) Write a assembly language program to identify the odd and even numbers from the array of 10 numbers. The even count store at a location 9000H and odd count store at location 9001H.
- 3) Draw the timing diagram for the instruction ADD B.
- b) Generate a control signals MEMR, MEMW, IOR and IOW by using the 3:8 decoder (74138).

3. Solve any two:

14

4

- 1) Interface  $2K \times 8$  EPROM memory to 8085. Give its initial and final address.
- 2) Explain the hardware interrupts of 8085.
- 3) Explain the Reset, HOLD and wait state of microprocessor 8085.

### 4. a) Solve any two:

10

- 1) Draw the PSW format and explain the flag registers of 8086.
- 2) Explain the Mode-1 of 8255.
- 3) Draw and explain R-2R Ladder type DAC.
- b) Draw the control word format of 8255 and determine the control word for the following:
  - 1) PA Input in mode 2 and PB in mode 1 as output port
  - 2) All ports are input except PCU.

4

Set Q



### 5. Solve **any two**:

14

- 1) Draw an interfacing circuitry to interface 8253 with 8085 in I/O mapped I/O mode, so as to have 30 H is the counter 0 address. Explain Mode-3 of 8253.
- 2) Interface common anode type seven segment display with 8085. Write a ALP to display 0 to 9 on it.
- 3) Interface ADC 0809 with 8085 in I/O mapped I/O mode. Write a ALP to read a analog input applied to channel-3 and store the digital value at memory location 9000 H.

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No.	Jet Jet	K

### T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 **MICROPROCESSORS**

Max. Marks: 70 Day and Date: Wednesday, 7-12-2016

Time: 10.00 a.m. to 1.00 p.m.

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

- 2) Figures to the **right** indicate **full** marks.
- 3) **Assume** suitable data **if** necessary.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

		WCQ/Objective	e i ype	Questions		
Duration	on : 30 Minutes	-				Marks:
1. Ch	noose the correct an	swer:				
1)	) If all the ports of 82	255 used in outpo	ut mod	le then the con	nmand word	is
	a) 80H	b) 90H	c)	A0H	d) B0H	
2)	) For generating squ to load in counter o	•		•	count value r	equired
	a) (500) <sub>10</sub>	b) (800) <sub>10</sub>	c)	(900) <sub>10</sub>	d) (1000) <sub>1</sub>	0
3)	The 8253 counters	starts counting o	nly if			
	a) GATE signal is	low	b)	GATE signal is	s high	
	c) CLK signal is lo	W	d)	CLK signal is I	nigh	
4)	) 8251 is a					

- a) UART
- b) USART
- c) Programmable Interrupt controller
- d) Programmable interval timer/counter

14

14



5)	Which pins are general PA0-PA7 c) PC4-PC7	eral purpose I/O pin	b)	uring mode-2 ope PB0-PB7 PC0-PC3	erati	ion of the 8255 ?
6)	a) Weighted register			Successive app	orox	imation
7)	c) R-2R ladder Control word formation baud rate factor 1x a) 41 H	•	aliz 5 b	•	stop	
8)	The number of flagaa) 5	•	,		,	13
9)	Tick mark the odd i a) XCHG	nstruction from the	_	ven DAA	d)	ADD B
10)	Microprocessor enals a) Any interrupt signal on F	ınal applied	b)	Low signal on F	REA	DY pin
11)	Which microproces transfer?  a) Reset and Read	у	b)	Ready and INTI		owledge a DMA
10\	c) HOLD and HLD		•	None of these		
12)	In memory mapped a) 8 bit	b) 32 bit		16 bit	d)	64 bit
13)	RST 7.5 interrupt is a) Level triggered c) –ve edge trigger			+ve edge trigge Both a) and b)	red	
14)	The length of the in					
	a) 4 byte	b) 5 byte	c)	6 byte	d)	8 byte



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

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

### 2. a) Solve any two:

10

- 1) Explain the XCHG, RST0 and JP 16 bit address instructions of 8085.
- 2) Write a assembly language program to identify the odd and even numbers from the array of 10 numbers. The even count store at a location 9000H and odd count store at location 9001H.
- 3) Draw the timing diagram for the instruction ADD B.
- b) Generate a control signals MEMR, MEMW, IOR and IOW by using the 3:8 decoder (74138).

3. Solve any two:

14

4

- 1) Interface  $2K \times 8$  EPROM memory to 8085. Give its initial and final address.
- 2) Explain the hardware interrupts of 8085.
- 3) Explain the Reset, HOLD and wait state of microprocessor 8085.

### 4. a) Solve any two:

10

- 1) Draw the PSW format and explain the flag registers of 8086.
- 2) Explain the Mode-1 of 8255.
- 3) Draw and explain R-2R Ladder type DAC.
- b) Draw the control word format of 8255 and determine the control word for the following:
  - 1) PA Input in mode 2 and PB in mode 1 as output port
  - 2) All ports are input except PCU.

4

Set R



### 5. Solve **any two**:

14

- 1) Draw an interfacing circuitry to interface 8253 with 8085 in I/O mapped I/O mode, so as to have 30 H is the counter 0 address. Explain Mode-3 of 8253.
- 2) Interface common anode type seven segment display with 8085. Write a ALP to display 0 to 9 on it.
- 3) Interface ADC 0809 with 8085 in I/O mapped I/O mode. Write a ALP to read a analog input applied to channel-3 and store the digital value at memory location 9000 H.

Seat	Set	
No.	Set .	5

# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Max. Marks: 70

Time: 10.00 a.m. to 1.00 p.m.

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

- 2) Figures to the **right** indicate **full** marks.
- 3) Assume suitable data if necessary.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

	Don't forget to	mention, Q.P. Set	(P/Q/R/S) on Top of Pa	age.
	MCQ/Objecti	ve Type Question	S	
Duration : 30 Minutes	·	•		ks : 14
1. Choose the correct	answer:			14
1) ADC 0809 is of _	ty	pe.		
a) Weighted reg c) R-2R ladder	gister	<ul><li>b) Successive</li><li>d) Dual slope</li></ul>	ve approximation	
•	•	initialize 8251 in a ngth 5 bits, no pari c) 50 H	asynchronous mode f ty, 1 stop bit is d) 40 H	or
<ul><li>3) The number of f</li><li>a) 5</li></ul>	lags present in 80 b) 8	086 are c) 9	d) 13	
4) Tick mark the or a) XCHG	dd instruction from b) RAL	m the given c) DAA	d) ADDB	
, , ,		ate when b) Low signa d) None of th	•	



6)	Which microprocessor pins are used to request and acknowledge a DMA transfer?					
	a) Reset and Read	у	b)	Ready and INTI	7	
	c) HOLD and HLD	4	d)	None of these		
7)	In memory mapped	I I/O; address widt	h is	;		
	a) 8 bit	b) 32 bit	c)	16 bit	d)	64 bit
8)	RST 7.5 interrupt is	}				
	a) Level triggered		b)	+ve edge trigge	red	
	c) -ve edge trigger	ed	d)	Both a) and b)		
9)	The length of the in	struction queue in	808	36 is		
	a) 4 byte	b) 5 byte	c)	6 byte	d)	8 byte
10)	If all the ports of 82	55 used in output r	no	de then the comi	mai	nd word is
	a) 80H	b) 90H	c)	AOH	d)	ВОН
11)	For generating squato load in counter o	•			oun	t value required
	a) (500) <sub>10</sub>	b) (800) <sub>10</sub>	c)	(900) <sub>10</sub>	d)	(1000) <sub>10</sub>
12)	The 8253 counter s	tarts counting only	/ if			
	a) GATE signal is I	OW	b)	GATE signal is	hig	h
	c) CLK signal is lov	N	d)	CLK signal is hi	gh	
13)	8251 is a					
	a) UART					
	b) USART					
	c) Programmable I	nterrupt controller				
	d) Programmable i	nterval timer/count	ter			
14)	Which pins are gene	eral purpose I/O pin	s dı	uring mode-2 ope	erat	ion of the 8255 ?
	a) PA0-PA7		b)	PB0-PB7		
	c) PC4-PC7		d)	PC0-PC3		

Set S



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – I) (New CGPA) Examination, 2016 MICROPROCESSORS

Day and Date: Wednesday, 7-12-2016 Marks: 56

Time: 10.00 a.m. to 1.00 p.m.

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

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

### 2. a) Solve any two:

10

- 1) Explain the XCHG, RST0 and JP 16 bit address instructions of 8085.
- 2) Write a assembly language program to identify the odd and even numbers from the array of 10 numbers. The even count store at a location 9000H and odd count store at location 9001H.
- 3) Draw the timing diagram for the instruction ADD B.
- b) Generate a control signals MEMR, MEMW, IOR and IOW by using the 3:8 decoder (74138).

3. Solve any two:

14

4

- 1) Interface  $2K \times 8$  EPROM memory to 8085. Give its initial and final address.
- 2) Explain the hardware interrupts of 8085.
- 3) Explain the Reset, HOLD and wait state of microprocessor 8085.

### 4. a) Solve any two:

10

- 1) Draw the PSW format and explain the flag registers of 8086.
- 2) Explain the Mode-1 of 8255.
- 3) Draw and explain R-2R Ladder type DAC.
- b) Draw the control word format of 8255 and determine the control word for the following:
  - 1) PA Input in mode 2 and PB in mode 1 as output port
  - 2) All ports are input except PCU.

4



### 5. Solve **any two** :

14

- 1) Draw an interfacing circuitry to interface 8253 with 8085 in I/O mapped I/O mode, so as to have 30 H is the counter 0 address. Explain Mode-3 of 8253.
- 2) Interface common anode type seven segment display with 8085. Write a ALP to display 0 to 9 on it.
- 3) Interface ADC 0809 with 8085 in I/O mapped I/O mode. Write a ALP to read a analog input applied to channel-3 and store the digital value at memory location 9000 H.

Seat	Set	Р
No.		

	•	• •	l) Examination, 2 AVE ENGINEER		
-	d Date : Monday, 21 0.00 a.m. to 1.00 p.			Max. Marks: 100	
1	<ul> <li>Instructions: 1) All questions are compulsory.</li> <li>2) Figures to the right indicate full marks.</li> <li>3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.</li> <li>4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.</li> </ul>				
Duratio	n : 30 Minutes	MCQ/Objective T	ype Questions	Marks : 20	
1. Ch	oose the correct ans	swer:		(1×20=20)	
1)	In E plane Tee, if in	nput is given to aux	kiliary arm, the outp	ut from main arms	
	<ul><li>are</li><li>a) In phase</li><li>c) 180° out of phase</li></ul>	se	b) 90° out of phas d) 270° out of pha		
2)	An air filled rectant operates in dominate a) 2.14 GHz	ant mode. The cut o			
3)	An air filled rectang The signal frequen a) 4.73 rad/m	cy is 3 GHz. The p		E <sub>10</sub> mode is	
4)	The characteristic	impedance of tran	smission line is giv	ren as z <sub>0</sub> =	
	a) $\sqrt{z/y}$	b) $\sqrt{zy}$	c) $\sqrt{z+y}$	d) $\sqrt{z-y}$	
5)	The reflection coef	ficient is generally	a complex quantity	that can be	
	expressed as $\overline{i}$ =				
	a) 180°	b) 0°	c) 90°	d) 270°	
6)	In rectangular wave a) TE	eguide, lower orde b) TM	r modes are not pre c) TEM	sent in d) TE & TM	
7)	The spacing betwe	en the centers of t	wo holes in directior	nal coupler must be	
	a) $(n + 1) \frac{1}{4}$	b) $(n + 2) \frac{\lambda}{4}$	c) $(2n + 1) \frac{\lambda}{4}$	d) $n_{4}^{\lambda}$	



8)	) A n type GaAS Gunn diode have a lengresistance of 16 $\Omega$ and applied voltage electric field is a) 2810 V/cm b) 2800 V/cm	V = 59 V. Then the threshold
9)	) In two valley theory, the negative resists a) $\Delta E = KT$ b) $\Delta E < KT$ c)	ance is achieved only when
10)	<ul> <li>A typical n type GaAS Gunn diode has electric field of 2800 V/cm. Then negative</li> <li>a) -3100 cm<sup>2</sup>/Vs</li> <li>b) -1500 cm<sup>2</sup>/Vs</li> </ul>	ve electron mobility is
11)	•	High freq. RF amplifier None of these
12)	,	_ and RF field is Stationary, Stationary Stationary, travelling
13)	) The maximum theoretical efficiency of t a) 22% b) 58% c)	wo cavity klystron is 85% d) 48%
14)	,	increases output power Increases None of these
15)	, -	Pavg=Pt*pulse width*prf None of these
16)	, ,	TWT is Folded line back Helical
17)	<ul><li>) In case of Magnetron frequency pushing variations.</li><li>a) Supply</li><li>b) Load</li><li>c)</li></ul>	
18)		
10)	data on an object.	
10\	a) Searching b) Tracking c)	·
19)	<ul><li>The Doppler effect causes a change in we moving object.</li><li>a) Phase</li><li>b) Frequency</li><li>c)</li></ul>	
20)	) Accurate Measurement of attenuation ca a) Power Ratio b)	



Seat	
No.	

# T.E. (E & TC) (Part – II) Examination, 2016 RADAR AND MICROWAVE ENGINEERING

Day and Date: Monday, 21-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

### SECTION-I

### 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) A transmission line has characteristic impedance of  $z_0$  = 50  $\Omega$  and resistance of 0.1  $\Omega$  /m. If the line is distortionless then calculate attenuation constant of line.
- 2) Show that  $TM_{01}$  and  $TM_{10}$  modes in a rectangular waveguide do not exist.
- 3) What is the importance of negative resistance. How this resistance is achieved in Tunnel diode?
- 4) Explain in detail measurement of unknown impedance using magic Tee.
- 5) Derive field equation for  $TE_{mn}$  mode.

### 3. Attempt any two:

 $(2 \times 10 = 20)$ 

- 1) Derive the relation between reflection coefficient and transmission coefficient of transmission line. Explain the steps which are used for calculation of these values with Smith chart by taking one example.
- 2) The longitudinal component of the magnetic field inside an air filled rectangular waveguide made of a perfect electric conductor is given by following expression.

$$Hz = 0.1 \cos (25 \pi x) \cos (30.3 \pi y) \cos (12 \pi \times 10^9 t - \beta z)$$

The cross sectional dimensions of the waveguide are given as  $a=0.08\,\text{m}$  and  $b=0.033\,\text{m}$ . Also calculate cut off frequency and guide wavelength of that mode.

3) Explain the working of two hole directional coupler and discuss the performance parameters of directional coupler.



### SECTION - II

### 4. Answer any four: (4×5=20)

- a) Calculate maximum range of radar system which operates at 3 cm with peak pulse power of 600 kW if its antenna is 5 m<sup>2</sup>, minimum detectable signal is  $10^{-13}$  W and the radar cross sectional area of the target is 20 m<sup>2</sup>.
- b) Draw a neat sketch of two cavity klystron amplifier. With the help of applegate diagram explain its working.
- c) Explain in A-scope and PPI Radar displays along with its limitations.
- d) Explain Phase shift measurement technique.
- e) Derive theoretical efficiency of reflex klystron.

### 5. Answer any two:

 $(2 \times 10 = 20)$ 

- a) Write similarities and differences between TWT and Klystron. Explain construction and working of TWT.
- b) X band cylindrical magnetron has following parameters.

Anode voltage = 26 kV

Beam current = 27 A

Magnetic flux density = 0.336 wb/m<sup>2</sup>

Cathode radius = 5 cm

Anode radius = 10 cm

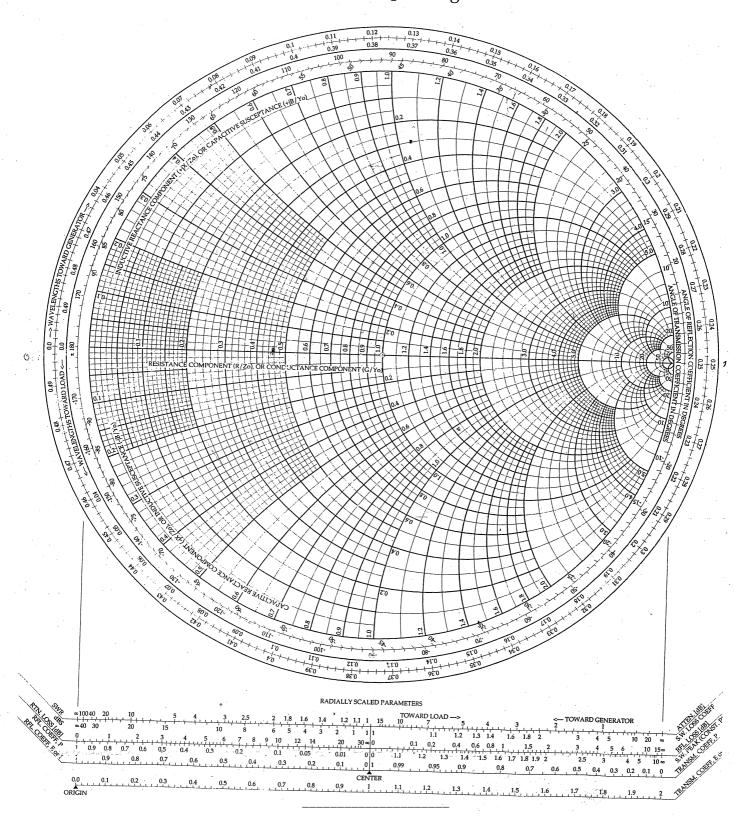
Calculate:

- 1) Cyclotron angular frequency
- 2) Hull's cut-off voltage
- 3) Cut-off magnetic flux density for given voltage.
- c) Draw block diagram and explain types of radars and its functions.



# The Complete Smith Chart

Black Magic Design



No.	Seat No.		Set	Q
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# T.E. (E & TC) (Part – II) Examination, 2016 RADAR AND MICROWAVE ENGINEERING

Day and Date : Monday, 21-11-2016	Max. Marks: 100
Time : 10.00 a.m. to 1.00 p.m.	
Instructions: 1) All questions are compulsory.	

,	3) C ir 4) <b>A</b>	igures to the <b>righ</b> D. No. <b>1</b> is <b>compuls</b> In Answer Book Pag Answer MCQ/Obj	t indicate <b>full</b> mar cory. It should be so ge No. 3. Each que ective type quest	rks. Noved in <b>first 30 minute</b> Instion carries <b>one</b> man It <b>ions on Page No.</b> 3 P/Q/R/S) on Top of	k. Bonly.
		MCQ/Objective	Type Questions		
Duratio	n : 30 Minutes			Mark	ks : 20
1. Ch	oose the correct an	swer:		(1×2	20=20)
1)	Mostly preferred si a) Zigzag c) Corrugated way		b) Folded line b	ack	
2)	In case of Magnetr variations. a) Supply				
3)		•		bearing and elevation	n
G)	data on an object.	orradar provided	ooriariadad rarigo,	boaring and olovalic	<b>,</b> , ,
	a) Searching	b) Tracking	c) Pulsed	d) MTI	
4)	moving object.	_	•	rf energy that strikes	
				d) None of these	
5)	Accurate Measure a) Power Ratio c) Using magic Te				
6)	In E plane Tee, if in	nput is given to aເ	ıxiliary arm, the οι	utput from main arm	S
	are a) In phase c) 180° out of phase	se	b) 90° out of ph d) 270° out of p		
7)		•		sions 7 cm $\times$ 3.5 c	m
	operates in domina a) 2.14 GHz	ant mode. The cut b) 21.4 GHz	of frequency is c) 2.14 MHz	d) 21.4 MHz	P.T.O.



R-EF	P – 141	-2-			
8)	An air filled rectang The signal frequen a) 4.73 rad/m		has	se constant for <sup>-</sup>	
9)	The characteristic i	mpedance of tran	sm	ission line is giv	ven as z <sub>0</sub> =
	a) $\sqrt{z/y}$	b) $\sqrt{zy}$	c)	$\sqrt{z+y}$	d) $\sqrt{z-y}$
10)	The reflection coef	ficient is generally	a c	omplex quantity	that can be
	expressed as $\overline{i}$ =	$ \overline{ }$ $ e^{\mathrm{j}\theta\mathrm{i}}$ . Then $\theta_\mathrm{i}$ f	or o	open circuit is	
	a) 180°	b) 0°			d) 270°
11)	In rectangular wave a) TE	eguide, lower orde b) TM		odes are not pre TEM	esent in d) TE & TM
12)	The spacing betwe	en the centers of t	wo	holes in directio	nal coupler must be
	a) $(n + 1)\frac{1}{4}$	b) $(n + 2) \frac{1}{4}$	c)	$(2n + 1) \frac{1}{4}$	d) $n\frac{\lambda}{4}$
13)	A n type GaAS Gur resistance of 16 $\Omega$ electric field is	and applied voltage	ge \	V = 59 V. Then t	he threshold
	a) 2810 V/cm	•	•		•
14)	In two valley theory a) $\Delta E = KT$	_			only when d) None of these
15)	electric field of 280	0 V/cm. Then neg	ativ	e electron mobi	ocity of $10^5$ m/s with lity is d) $-2000$ cm <sup>2</sup> /Vs
16)	TWT is used as a) Low noise RF and c) Both a) and b)	mplifier	•	High freq. RF a	amplifier
17)	In TWT electron be a) Travelling, Static c) Travelling, Travelling,	onary	b)	_ and RF field is Stationary, Sta Stationary, trav	tionary
18)	The maximum theo a) 22%	oretical efficiency of b) 58%		wo cavity klystro 85%	on is d) 48%
19)	In reflex klystron as a) Remains consta c) Decreases		b)	ncreases outpu Increases None of these	t power
20)	The average powe given by a) Pavg=Pt*duty c c) Both of the above	ycle	b)	smitter power P Pavg=Pt*pulse None of these	t and the duty cycle width*prf



Seat	
No.	

# T.E. (E & TC) (Part – II) Examination, 2016 RADAR AND MICROWAVE ENGINEERING

Day and Date: Monday, 21-11-2016

Time: 10.00 a.m. to 1.00 p.m.

### SECTION - I

# 2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- 1) A transmission line has characteristic impedance of  $z_0 = 50 \Omega$  and resistance of 0.1  $\Omega$  /m. If the line is distortionless then calculate attenuation constant of line.
- 2) Show that  $TM_{01}$  and  $TM_{10}$  modes in a rectangular waveguide do not exist.
- 3) What is the importance of negative resistance. How this resistance is achieved in Tunnel diode?
- 4) Explain in detail measurement of unknown impedance using magic Tee.
- 5) Derive field equation for  $TE_{mn}$  mode.

## 3. Attempt any two:

 $(2 \times 10 = 20)$ 

- 1) Derive the relation between reflection coefficient and transmission coefficient of transmission line. Explain the steps which are used for calculation of these values with Smith chart by taking one example.
- 2) The longitudinal component of the magnetic field inside an air filled rectangular waveguide made of a perfect electric conductor is given by following expression.

$$Hz = 0.1 \cos (25 \pi x) \cos (30.3 \pi y) \cos (12 \pi \times 10^9 t - \beta z)$$

The cross sectional dimensions of the waveguide are given as  $a=0.08\,\text{m}$  and  $b=0.033\,\text{m}$ . Also calculate cut off frequency and guide wavelength of that mode.

3) Explain the working of two hole directional coupler and discuss the performance parameters of directional coupler.



### SECTION - II

# 4. Answer any four: (4×5=20)

- a) Calculate maximum range of radar system which operates at 3 cm with peak pulse power of 600 kW if its antenna is 5 m<sup>2</sup>, minimum detectable signal is  $10^{-13}$  W and the radar cross sectional area of the target is 20 m<sup>2</sup>.
- b) Draw a neat sketch of two cavity klystron amplifier. With the help of applegate diagram explain its working.
- c) Explain in A-scope and PPI Radar displays along with its limitations.
- d) Explain Phase shift measurement technique.
- e) Derive theoretical efficiency of reflex klystron.

## 5. Answer any two:

 $(2 \times 10 = 20)$ 

- a) Write similarities and differences between TWT and Klystron. Explain construction and working of TWT.
- b) X band cylindrical magnetron has following parameters.

Anode voltage = 26 kV

Beam current = 27 A

Magnetic flux density =  $0.336 \text{ wb/m}^2$ 

Cathode radius = 5 cm

Anode radius = 10 cm

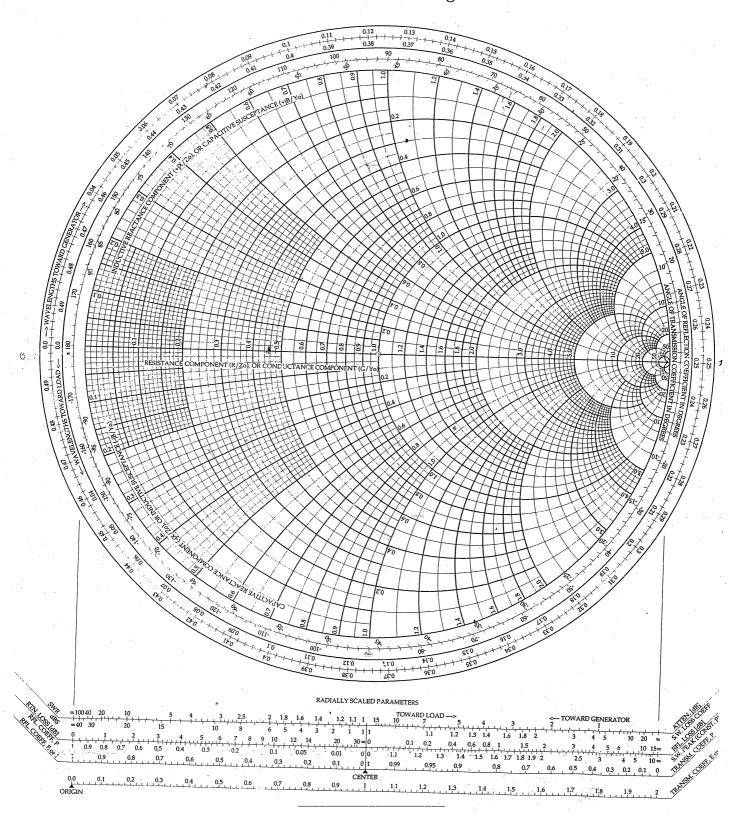
Calculate:

- 1) Cyclotron angular frequency
- 2) Hull's cut-off voltage
- 3) Cut-off magnetic flux density for given voltage.
- c) Draw block diagram and explain types of radars and its functions.



# The Complete Smith Chart

Black Magic Design



Seat No.		Set	R
	•	•	

		E. (E & TC) (Par DAR AND MICF	•		•	
•	d Date : Monda 0.00 a.m. to 1.	•			Max.	Marks : 100
,		<ol> <li>All questions a.</li> <li>Figures to the r.</li> <li>Q. No. 1 is compound in Answer Book</li> <li>Answer MCQ/ODOn't forget to</li> </ol>	r <b>ight</b> ind <b>culsory</b> . Page No <b>Objectiv</b>	licate <b>full</b> marl It should be sol o. <b>3. Each</b> quest v <b>e type quest</b> l	ved in <b>first 30</b> stion carries <b>o</b> i <b>ons on Pag</b>	ne mark. e No. 3 only.
Duratio	n : 30 Minutes	MCQ/Object	ive Type	Questions		Marks : 20
	oose the correct TWT is used a a) Low noise c) Both a) and	as RF amplifier	,	High freq. RF	•	(1×20=20)
2)	,	on beam is Stationary	b)	_ and RF field Stationary, St Stationary, tra	is tationary	
3)	The maximum a) 22%	n theoretical efficie b) 58%		vo cavity klyst 85%		
4)	In reflex klystr a) Remains c c) Decreases		b)	ncreases outp Increases None of these	·	
5)	The average p given by a) Pavg=Pt*d c) Both of the	• •	b)	smitter power Pavg=Pt*puls None of these	se width*prf	ıty cycle
6)	-	ed slow wave stru	cture in b)			
7)	In case of Mag variations. a) Supply	gnetron frequency p	_	takes place du Frequency	ue to d) Amplitu	



8)	type data on an object.	of radar provides c	ontinuous range, be	earing and elevation
	a) Searching	b) Tracking	c) Pulsed	d) MTI
9)	moving object.	_	n what aspect of rf e	energy that strikes a
10)	•	,	,	•
10)	Accurate Measurer <ul><li>a) Power Ratio</li><li>c) Using magic Tea</li></ul>		b) RF substitution d) Using slotted lii	
11)	In E plane Tee, if in are	put is given to aux		
	<ul><li>a) In phase</li><li>c) 180° out of phase</li></ul>	e	<ul><li>b) 90° out of phas</li><li>d) 270° out of pha</li></ul>	
12)	An air filled rectan operates in domina a) 2.14 GHz	nt mode. The cut o		
10\	,	•	,	,
13)	An air filled rectang The signal frequence a) 4.73 rad/m	cy is 3 GHz. The p	hase constant for T	「E <sub>10</sub> mode is
14)	The characteristic i	mpedance of trans	smission line is giv	ven as z <sub>0</sub> =
	a) $\sqrt{z/y}$	b) $\sqrt{zy}$	c) $\sqrt{z+y}$	d) $\sqrt{z-y}$
15)	The reflection coeff	ficient is generally	a complex quantity	that can be
	expressed as $\overline{i}$ =	$ \overline{i} e^{j\theta i}$ . Then $\theta_i$ for	or open circuit is	
	a) 180°	b) 0°	c) 90°	d) 270°
16)	In rectangular wave a) TE		r modes are not pre c) TEM	
17)	The spacing betwe	•	•	,
,	a) $(n + 1)\frac{1}{4}$			
18)	A n type GaAS Gur resistance of 16 $\Omega$ electric field is		_	
	a) 2810 V/cm	b) 2800 V/cm	c) 2805 V/cm	d) 2815 V/cm
19)	In two valley theory a) $\Delta E = KT$	_		-
20)	A typical n type Gazelectric field of 2800 a) $-3100  \text{cm}^2/\text{Vs}$	0 V/cm. Then nega	ative electron mobil	



Seat	
No.	

# T.E. (E & TC) (Part – II) Examination, 2016 RADAR AND MICROWAVE ENGINEERING

Day and Date: Monday, 21-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

### SECTION - I

# 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) A transmission line has characteristic impedance of  $z_0$  = 50  $\Omega$  and resistance of 0.1  $\Omega$  /m. If the line is distortionless then calculate attenuation constant of line.
- 2) Show that  $TM_{01}$  and  $TM_{10}$  modes in a rectangular waveguide do not exist.
- 3) What is the importance of negative resistance. How this resistance is achieved in Tunnel diode?
- 4) Explain in detail measurement of unknown impedance using magic Tee.
- 5) Derive field equation for  $TE_{mn}$  mode.

## 3. Attempt any two:

 $(2 \times 10 = 20)$ 

- 1) Derive the relation between reflection coefficient and transmission coefficient of transmission line. Explain the steps which are used for calculation of these values with Smith chart by taking one example.
- 2) The longitudinal component of the magnetic field inside an air filled rectangular waveguide made of a perfect electric conductor is given by following expression.

$$Hz = 0.1 \cos (25 \pi x) \cos (30.3 \pi y) \cos (12 \pi \times 10^9 t - \beta z)$$

The cross sectional dimensions of the waveguide are given as  $a=0.08\,\text{m}$  and  $b=0.033\,\text{m}$ . Also calculate cut off frequency and guide wavelength of that mode.

3) Explain the working of two hole directional coupler and discuss the performance parameters of directional coupler.



### SECTION - II

# 4. Answer any four: (4×5=20)

- a) Calculate maximum range of radar system which operates at 3 cm with peak pulse power of 600 kW if its antenna is 5 m<sup>2</sup>, minimum detectable signal is  $10^{-13}$  W and the radar cross sectional area of the target is 20 m<sup>2</sup>.
- b) Draw a neat sketch of two cavity klystron amplifier. With the help of applegate diagram explain its working.
- c) Explain in A-scope and PPI Radar displays along with its limitations.
- d) Explain Phase shift measurement technique.
- e) Derive theoretical efficiency of reflex klystron.

## 5. Answer any two:

 $(2 \times 10 = 20)$ 

- a) Write similarities and differences between TWT and Klystron. Explain construction and working of TWT.
- b) X band cylindrical magnetron has following parameters.

Anode voltage = 26 kV

Beam current = 27 A

Magnetic flux density =  $0.336 \text{ wb/m}^2$ 

Cathode radius = 5 cm

Anode radius = 10 cm

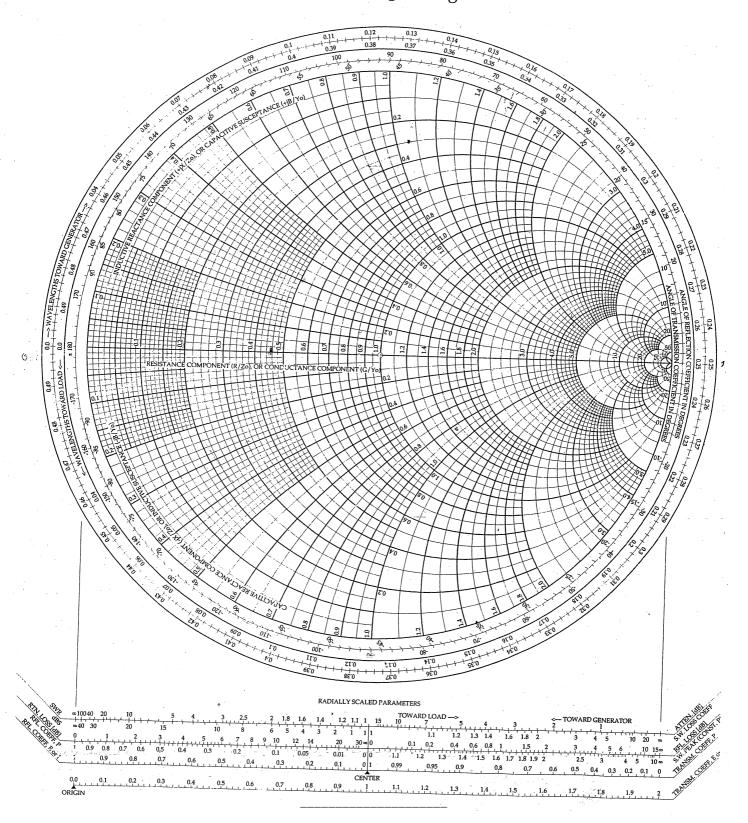
Calculate:

- 1) Cyclotron angular frequency
- 2) Hull's cut-off voltage
- 3) Cut-off magnetic flux density for given voltage.
- c) Draw block diagram and explain types of radars and its functions.



# The Complete Smith Chart

Black Magic Design



•   •   •   •

a) 22%

b) 58%

# **SLR-EP - 141**

Seat No.	Set	S
No.		

# T.E. (E & TC) (Part – II) Examination, 2016 RADAR AND MICROWAVE ENGINEERING

	RADAR	AND MICROW	AVE ENGINEER	RING
-	d Date : Monday, 21- 0.00 a.m. to 1.00 p.r			Max. Marks: 100
,	3) Q. in. 4) <b>A</b> I	gures to the <b>right</b> No. <b>1</b> is <b>compulso</b> AnswerBookPage <b>nswerMCQ/Obje</b>	indicate <b>full</b> marks ry. It should be solve No. <b>3. Each</b> question ctive type question	ed in <b>first 30 minutes</b> on carries <b>one</b> mark. <b>ns on Page No. 3 only.</b> Q/R/S) on Top of Page.
		MCQ/Objective Ty	ype Questions	
Duratio	n : 30 Minutes			Marks : 20
1. Ch	oose the correct ans	wer:		(1×20=20)
1)	In rectangular wave a) TE	guide, lower order b) TM	r modes are not pre c) TEM	esent in d) TE & TM
2)	The spacing between	en the centers of tw	wo holes in direction	nal coupler must be
	a) $(n + 1)\frac{\lambda}{4}$	b) $(n + 2) \frac{1}{4}$	c) $(2n + 1) \frac{1}{4}$	d) $n\frac{\lambda}{4}$
3)	An type GaAS Gur resistance of 16 $\Omega$ electric field is	and applied voltag	ge V = 59 V. Then the	ne threshold
4)	a) 2810 V/cm	•	c) 2805 V/cm	•
4)	In two valley theory a) $\Delta E = KT$	_	c) $\Delta E > KT$	_
5)	A typical n type Gaze electric field of 2800 a) -3100 cm <sup>2</sup> /Vs	V/cm. Then nega	ative electron mobil	lity is
6)	TWT is used as a) Low noise RF ar c) Both a) and b)	nplifier	b) High freq. RF a d) None of these	mplifier
7)	In TWT electron bea a) Travelling, Static c) Travelling, Trave	onary	and RF field is b) Stationary, Stat d) Stationary, trav	•
8)	The maximum theo	retical efficiency o	of two cavity klystro	n is

c) 85%

d) 48%



9)	,					
10)	The average powe given by	·		·		
	<ul><li>a) Pavg=Pt*duty c</li><li>c) Both of the abov</li></ul>	ycle ⁄e	b) d)	Pavg=Pt*pulse None of these	WiC	lth*prf
11)	Mostly preferred slap zigzag c) Corrugated wave		b)	Folded line bac	k	
12)	In case of Magnetro variations.		•		to_	
	a) Supply	b) Load	c)	Frequency	d)	Amplitude
13)	type	of radar provides c	onti	inuous range, be	arir	ng and elevation
	data on an object.	·		_		
	a) Searching	b) Tracking	c)	Pulsed	d)	MTI
14)	The Doppler effect moving object.	_		-		
	a) Phase	b) Frequency	c)	Energy	d)	None of these
15)	Accurate Measurer					method.
	a) Power Ratio		<ul><li>b) RF substitution</li><li>d) Using slotted line</li></ul>			
40)	c) Using magic Te					
16)	In E plane Tee, if in are	iput is given to aux	(IIIa	ry arm, the outp	ut t	rom main arms
	a) In phase		b)	90° out of phase	Э	
	c) 180° out of phas	se	•	270° out of phas		
17)	An air filled rectan	-			ns	7 cm × 3.5 cm
	a) 2.14 GHz	b) 21.4 GHz			d)	21.4 MHz
18)	An air filled rectangular waveguide has dimension of a = 6 cm and 6 = 4 cm. The signal frequency is 3 GHz. The phase constant for $TE_{10}$ mode is a) 4.73 rad/m b) 24.73 rad/m c) 34.73 rad/m d) 44.73 rad/m					
19)	The characteristic i	impedance of tran	smi	ssion line is giv	en	as z <sub>0</sub> =
	a) $\sqrt{z/y}$	b) $\sqrt{zy}$	c)	$\sqrt{z+y}$	d)	$\sqrt{z-y}$
20)	The reflection coef	ficient is generally	a c	omplex quantity	tha	at can be
	expressed as $\overline{i}$ =	$ \overline{i} e^{j\theta i}$ . Then $\theta_i$ f	or c	pen circuit is		
	a) 180°	b) 0°		90°	d)	270°



Seat	
No.	

# T.E. (E & TC) (Part – II) Examination, 2016 RADAR AND MICROWAVE ENGINEERING

Day and Date: Monday, 21-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

### SECTION-I

# 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) A transmission line has characteristic impedance of  $z_0$  = 50  $\Omega$  and resistance of 0.1  $\Omega$  /m. If the line is distortionless then calculate attenuation constant of line.
- 2) Show that  $TM_{01}$  and  $TM_{10}$  modes in a rectangular waveguide do not exist.
- 3) What is the importance of negative resistance. How this resistance is achieved in Tunnel diode?
- 4) Explain in detail measurement of unknown impedance using magic Tee.
- 5) Derive field equation for  $TE_{mn}$  mode.

# 3. Attempt any two:

 $(2 \times 10 = 20)$ 

- 1) Derive the relation between reflection coefficient and transmission coefficient of transmission line. Explain the steps which are used for calculation of these values with Smith chart by taking one example.
- 2) The longitudinal component of the magnetic field inside an air filled rectangular waveguide made of a perfect electric conductor is given by following expression.

$$Hz = 0.1 \cos (25 \pi x) \cos (30.3 \pi y) \cos (12 \pi \times 10^9 t - \beta z)$$

The cross sectional dimensions of the waveguide are given as  $a=0.08\,\text{m}$  and  $b=0.033\,\text{m}$ . Also calculate cut off frequency and guide wavelength of that mode.

3) Explain the working of two hole directional coupler and discuss the performance parameters of directional coupler.



### SECTION - II

# 4. Answer any four: (4×5=20)

- a) Calculate maximum range of radar system which operates at 3 cm with peak pulse power of 600 kW if its antenna is 5 m<sup>2</sup>, minimum detectable signal is  $10^{-13}$  W and the radar cross sectional area of the target is 20 m<sup>2</sup>.
- b) Draw a neat sketch of two cavity klystron amplifier. With the help of applegate diagram explain its working.
- c) Explain in A-scope and PPI Radar displays along with its limitations.
- d) Explain Phase shift measurement technique.
- e) Derive theoretical efficiency of reflex klystron.

## 5. Answer any two:

 $(2 \times 10 = 20)$ 

- a) Write similarities and differences between TWT and Klystron. Explain construction and working of TWT.
- b) X band cylindrical magnetron has following parameters.

Anode voltage = 26 kV

Beam current = 27 A

Magnetic flux density =  $0.336 \text{ wb/m}^2$ 

Cathode radius = 5 cm

Anode radius = 10 cm

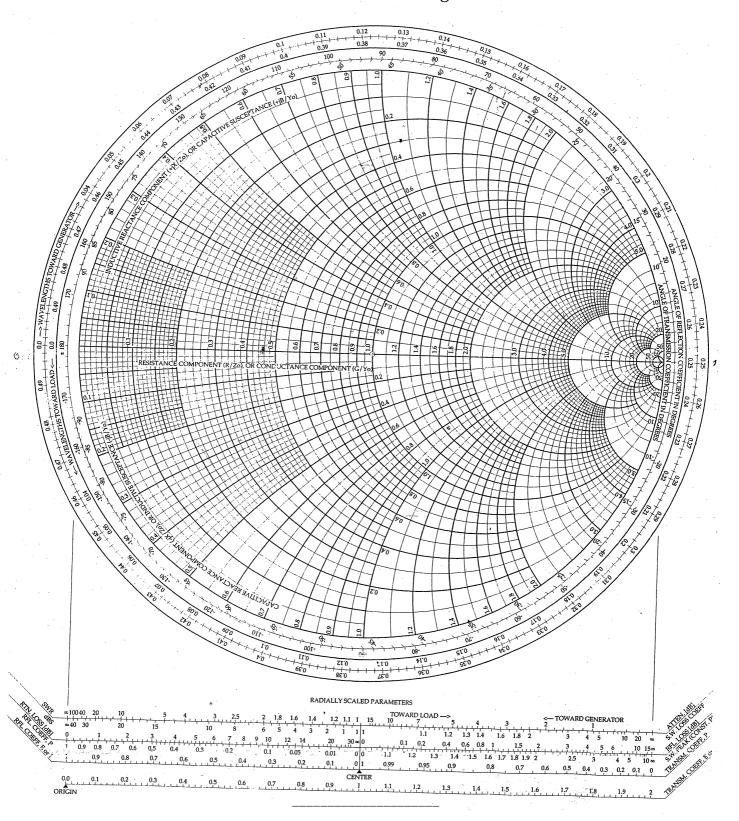
Calculate:

- 1) Cyclotron angular frequency
- 2) Hull's cut-off voltage
- 3) Cut-off magnetic flux density for given voltage.
- c) Draw block diagram and explain types of radars and its functions.



# The Complete Smith Chart

Black Magic Design



Seat No.			Set	Р

ı	•			on) (Part — II) Ex D APPLICATIO		nation, 2016
•	d Date : Tuesda 0.00 a.m. to 1.0	•				Total Marks : 100
1	Instructions :	Answer Boo 4) <b>Answer M</b>	itable data <b>if i</b> compulsory. ok Page No. 3 C <b>Q/Objective</b>	necessary. It should be solve B. Each question In type question	carr <b>s on</b>	first 30 minutes in ies one mark. Page No. 3 only. on Top of Page.
		MCQ/OI	bjective Type	Questions		
Duration	n : 30 Minutes					Marks: 20
	_	program will re send the numbo A, P1 ,READ	er FFH to port	•	mine	whether bit 2 is
2)	Device pins XT oscillator or crya) True			are used for conr False	ectio	ons to an external
3)	The total exter a) 32 K	nal data memo b) 64 K	-	interfaced to the		1 is 256 K
4)	The 8051 has a) 2	b) 3	oarallel I/O po c)	_	d)	5
5)	How many tim a) 2	ers available in b) 8	8051 ? c)	4	d)	6
6)	The internal R a) 64 bytes	AM memory of b) 128 b		32 bytes	d)	256 bytes
7)	After reset SP a) 1 H	settles at the ac b) 0 H		7 H	d)	6 H
8)	On power up, a) 00-2F	the 8051 uses v b) 00-7l		cations for regist		0-R7 00-0F



9)	Which of the following accumulator?  a) MOV A, P27 c) MOV A, 27H	ng commands will m	b)	e the number 27 I MOV A, #27H MOV A, @27	H in	to the
10)	,	tion in the	is LOW, the program counter points to the  b) Internal data memory			·
	c) External code me					
11)	PIC 16F877 devices program r	nemory.				
	a) 8,256 K × 8	,	•		•	
12)	Before execution of The contents after e	xecution will be				
\	a) 0 × 5f	,	,	O×FF	d)	None of these
13)	<ul><li>After stack has been</li><li>a) Result in loss of</li><li>b) Sets stack overfle</li><li>c) Overwrites the va</li><li>d) Overwrites the va</li></ul>	pushed data ow bit alue that was stored	fro	m the first push		
14)	Interrupt flag bit get sits corresponding en a) True for maskabl c) False for all inter	able bit or global er e interrupts only	ab b)	le bit the stateme	nt is	6
15)	RTC DS1307 suppo	ort pro	otoc	col.		
·	a) I2C				d)	All of the above
16)	How many bytes of I data?	RAM is the RTC DS	13	07 are set aside t	or t	he clock and
	a) 8 byte	b) 56 byte	c)	7 byte	d)	128 byte
	In capture mode whi a) Timer 0	b) Timer 1		Timer 2	d)	Timer 3
18)	In compare mode a) Timer 0	b) Timer 1	c)	Timer 2	d)	Timer 3
,	a) Capture Control c) Compare Contro	Protocol I Protocol	,	Capture/Compa None of the abo		PWM
20)	The PWM period is a) PR2 c) CCPCON	specified by	,	TMR2 None of the abo	ve	



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MICROCONTROLLER AND APPLICATIONS

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

2) Assume suitable data if necessary.

## 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) Write a program in assembly or "C" language to generate a square wave of 1 KHz with 50% duty cycle on P1.5 pin of 8051 microcontroller. Use timer 0 to generate the delay.
- 2) Describe serial modes of 8051 microcontroller.
- 3) Explain the ports of 8051 microcontroller used for external memory access.
- 4) Draw and explain the formats of SFR□s
  - 1) SCON
  - 2) PCON.
- 5) Draw pin-out of 14 pin LCD display and state the functions of
  - 1) RS
  - 2) EN
  - 3) R/W.

### 3. Attempt any two:

 $(2\times10=20)$ 

- 1) Write assembly or "C" language program to transfer the message "SOLAPUR" serially at baud rate 4800, 8 bit data and 1 stop bit.
- 2) Draw the labeled diagram of interfacing DAC with 8051 microcontroller. Write a program in assembly or "C" language to generate a saw-tooth waveform.
- 3) What are the steps in executing an interrupts? Explain in detail all the six interrupts in 8051.



## 4. Answer any four:

 $(4 \times 5 = 20)$ 

- 1) Explain A/D conversion in PIC16F877.
- 2) Explain logical instruction related to PIC.
- 3) Explain how data is transferred using inter integrated circuit bus.
- 4) Write a note on watchdog timer.
- 5) List the feature of PIC microcontroller.
- 6) Explain interrupts in PIC 16F877.

## 5. Answer any two:

 $(2 \times 10 = 20)$ 

- 1) Explain in details I<sup>2</sup>C module. Explain how to initialize MSSP module in I<sup>2</sup>C mode.
- 2) Explain PCON, OPTION and STATUS registers of 16F877 and explain memory mapping in it.
- 3) Explain the different memories available in PIC 16F877.

# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MICROCONTROLLER AND APPLICATIONS

Day and Date:	Tuesday, 22-11-2016	Total Marks : 100

Time: 10.00 a.m. to 1.00 p.m.

a) True

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

- 2) Assume suitable data if necessary.
- 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

**MCQ/Objective Type Questions Duration: 30 Minutes** Marks: 20 1. Choose the correct answer: 1) How many bytes of RAM is the RTC DS 1307 are set aside for the clock and data? a) 8 byte b) 56 byte c) 7 byte d) 128 byte 2) In capture mode which timer is used? a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3 3) In compare mode \_\_\_ is used. a) Timer 0 b) Timer 1 c) Timer 2 d) Timer 3 4) CCP means a) Capture Control Protocol b) Capture/Compare PWM d) None of the above c) Compare Control Protocol 5) The PWM period is specified by \_\_ b) TMR2 a) PR2 c) CCPCON d) None of the above 6) The following program will receive data from port 1, determine whether bit 2 is high and then send the number FFH to port 3 READ: MOV A, P1 ANL A,#2H CJNE A,#02H,READ MOV P3,#FFH a) True b) False 7) Device pins XTAL1 and XTAL2 for the 8051 are used for connections to an external oscillator or crystal.

b) False



8)	The total external da	•				
٥,	a) 32 K	b) 64 K	,	128 K	a)	256 K
9)	The 8051 has				۹/	E
40)	a) 2	b) 3	c)	4	d)	5
10)	How many timers as a) 2	b) 8	c)	4	d)	6
11)	The internal RAM m a) 64 bytes	-	c)	32 bytes	d)	256 bytes
12)	After reset SP settles a) 1 H	s at the address b) 0 H	c)	7 H	d)	6 H
13)	On power up, the 80 a) 00-2F	051 uses which RAN b) 00-7F		cations for registe		0-R7 00-0F
1/1\	Which of the following	,	,		,	
14)	accumulator?	ig commands will in	IOV	e the number 27 i		to tile
	a) MOV A, P27 c) MOV A, 27H		,	MOV A, #27H MOV A, @27		
15)	When the 8051 is res	set and the EA line is	,	•	cou	nter points to the
,	first program instruct			, p g		
	a) Internal code me	•	,	Internal data me		•
	c) External code me		,	External data me		•
16)	PIC 16F877 devices		ogr	am counter capal	ole (	of addressing
	$\frac{\text{program r}}{\text{a) } 8,256 \text{ K} \times 8}$	•	c)	13, 8 K × 14	d)	14, 8 K × 13
17)	Before execution of		wc	orking register cor	nter	nts were $O \times A3$ .
	The contents after e		-1	0 55	-1\	Name of the con-
40)	a) O×5f	•	,		a)	None of these
18)	After stack has been a) Result in loss of b) Sets stack overfle c) Overwrites the va d) Overwrites the va	pushed data ow bit alue that was stored	fro	m the first push		
19)	Interrupt flag bit get s its corresponding en a) True for maskabl c) False for all inter	able bit or global er le interrupts only	nab b)		nt is	8
20)	RTC DS1307 suppo a) I2C	ort pro b) SPI		col. PSP	d)	All of the above



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MICROCONTROLLER AND APPLICATIONS

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

2) Assume suitable data if necessary.

### 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) Write a program in assembly or "C" language to generate a square wave of 1 KHz with 50% duty cycle on P1.5 pin of 8051 microcontroller. Use timer 0 to generate the delay.
- 2) Describe serial modes of 8051 microcontroller.
- 3) Explain the ports of 8051 microcontroller used for external memory access.
- 4) Draw and explain the formats of SFR□s
  - 1) SCON
  - 2) PCON.
- 5) Draw pin-out of 14 pin LCD display and state the functions of
  - 1) RS
  - 2) EN
  - 3) R/W.

### 3. Attempt any two:

 $(2\times10=20)$ 

- 1) Write assembly or "C" language program to transfer the message "SOLAPUR" serially at baud rate 4800, 8 bit data and 1 stop bit.
- 2) Draw the labeled diagram of interfacing DAC with 8051 microcontroller. Write a program in assembly or "C" language to generate a saw-tooth waveform.
- 3) What are the steps in executing an interrupts? Explain in detail all the six interrupts in 8051.



## 4. Answer any four:

 $(4 \times 5 = 20)$ 

- 1) Explain A/D conversion in PIC16F877.
- 2) Explain logical instruction related to PIC.
- 3) Explain how data is transferred using inter integrated circuit bus.
- 4) Write a note on watchdog timer.
- 5) List the feature of PIC microcontroller.
- 6) Explain interrupts in PIC 16F877.

### 5. Answer any two:

 $(2 \times 10 = 20)$ 

- 1) Explain in details I<sup>2</sup>C module. Explain how to initialize MSSP module in I<sup>2</sup>C mode.
- 2) Explain PCON, OPTION and STATUS registers of 16F877 and explain memory mapping in it.
- 3) Explain the different memories available in PIC 16F877.

Seat No.	et	R
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# T.F. (Flectronics and Telecommunication) (Part – II) Examination, 2016.

•	•	MICROCONTROL			·	2010
•	d Date : Tuesda 0.00 a.m. to 1.0				Total	Marks : 100
•	Instructions :	4) Answer MCQ/	ole data <b>if</b> Inpulsory. Page No. ( Objective	necessary. It should be s 3. Each ques e type quest	tion carries <b>one</b> r	nark. <b>o. 3 only.</b>
		MCQ/Objec	ctive Type	Questions		
Duration	n: 30 Minutes					Marks: 20
1. Ch	oose the correc	t answer :				
1)		evices gram memory.	_ bit progr	am counter c	apable of addres	sing
	a) $8,256 \text{ K} \times 8$	b) 16, 64 K	×8 c)	13, 8 K × 14	d) 14, 8 K ×	: 13
2)	The contents a	ion of ANDLW O $\times$ after execution will	be			
_,	a) O×5f	b) O × 03	c)		d) None of t	these
3)	<ul><li>a) Result in lo</li><li>b) Sets stack</li><li>c) Overwrites</li></ul>	s been pushed eighoss of pushed data overflow bit the value that was the value that was	stored fro	m the first pu	sh	
4)	its correspond a) True for ma	oit get set when on i ling enable bit or glo askable interrupts o Il interrupts	obal enab only b)	le bit the state True for all in	ement is nterrupt	state of
5)	RTC DS1307	support	proto	col.		
	a) I2C	b) SPI	c)	PSP	d) All of the	above
6)	data?	tes of RAM is the R				
<b>→</b> \	a) 8 byte	b) 56 byte	•	7 byte	d) 128 byte	
7)	a) Timer 0	de which timer is us b) Timer 1		Timer 2	d) Timer 3	



8)	In compare mode a) Timer 0			Timer 2	d)	Timer 3
9)	a) Capture Control c) Compare Control	Protocol		Capture/Compar None of the above		WM
10)	The PWM period is an incompart and an in	specified by	,	TMR2 None of the above	ve	
11)	The following prograting high and then send to READ: MOV A, P1 ANL A,#2H CJNE A,#02H,REAI MOV P3,#FFH a) True	the number FFH to	por	•	nine	whether bit 2 is
12)	Device pins XTAL1 a oscillator or crystal.  a) True	nd XTAL2 for the 80		are used for conne False	ectio	ons to an external
13)	The total external da a) 32 K	ita memory that car b) 64 K	ı be			i1 is 256 K
	The 8051 has	b) 3		orts. 4	d)	5
15)	How many timers av a) 2	/ailable in 8051 ? b) 8	c)	4	d)	6
16)	The internal RAM mea) 64 bytes	emory of 8051 is b) 128 bytes	c)	32 bytes	d)	256 bytes
	After reset SP settles a) 1 H		c)	7 H	d)	6 H
18)	On power up, the 80 a) 00-2F	051 uses which RAM b) 00-7F		cations for registe 00-07		0-R7 00-0F
19)	Which of the followir accumulator? a) MOV A, P27 c) MOV A, 27H	,	nove b)		,	
20)	When the 8051 is res first program instruct a) Internal code me c) External code me	tion in the mory	b)	OW, the program of Internal data med External data med	mor	у



Seat	
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# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MICROCONTROLLER AND APPLICATIONS

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

2) Assume suitable data if necessary.

## 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) Write a program in assembly or "C" language to generate a square wave of 1 KHz with 50% duty cycle on P1.5 pin of 8051 microcontroller. Use timer 0 to generate the delay.
- 2) Describe serial modes of 8051 microcontroller.
- 3) Explain the ports of 8051 microcontroller used for external memory access.
- 4) Draw and explain the formats of SFR□s
  - 1) SCON
  - 2) PCON.
- 5) Draw pin-out of 14 pin LCD display and state the functions of
  - 1) RS
  - 2) EN
  - 3) R/W.

### 3. Attempt any two:

 $(2\times10=20)$ 

- 1) Write assembly or "C" language program to transfer the message "SOLAPUR" serially at baud rate 4800, 8 bit data and 1 stop bit.
- 2) Draw the labeled diagram of interfacing DAC with 8051 microcontroller. Write a program in assembly or "C" language to generate a saw-tooth waveform.
- 3) What are the steps in executing an interrupts? Explain in detail all the six interrupts in 8051.



## 4. Answer any four:

 $(4 \times 5 = 20)$ 

- 1) Explain A/D conversion in PIC16F877.
- 2) Explain logical instruction related to PIC.
- 3) Explain how data is transferred using inter integrated circuit bus.
- 4) Write a note on watchdog timer.
- 5) List the feature of PIC microcontroller.
- 6) Explain interrupts in PIC 16F877.

### 5. Answer any two:

 $(2 \times 10 = 20)$ 

- 1) Explain in details I<sup>2</sup>C module. Explain how to initialize MSSP module in I<sup>2</sup>C mode.
- 2) Explain PCON, OPTION and STATUS registers of 16F877 and explain memory mapping in it.
- 3) Explain the different memories available in PIC 16F877.

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# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MICROCONTROLLER AND APPLICATIONS

	I	MICROCONTROLLE	R AND APPLICATION	ONS	
-	d Date : Tuesda 0.00 a.m. to 1.0	-		Total Marks : 10	0
1	Instructions :	Answer Book Page 4) <b>Answer MCQ/Obj</b>	ata <b>if necessary</b> . I <b>sory</b> . It should be sole No. <b>3. Each</b> questic I <b>ective type questio</b>	lved in <b>first 30 minutes</b> in on carries <b>one</b> mark. ons on Page No. 3 only. O/R/S) on Top of Page.	
Duration	n : 30 Minutes	MCQ/Objective	Type Questions	Marks : 2	O
					•
	oose the correc				
1)	The internal R a) 64 bytes	AM memory of 8051 is b) 128 bytes	c) 32 bytes	d) 256 bytes	
2)	After reset SP a) 1 H	settles at the address b) 0 H	c) 7 H	d) 6 H	
3)		the 8051 uses which R			
	a) 00-2F	b) 00-7F	c) 00-07	d) 00-0F	
4)		ollowing commands wil	I move the number 2	7 H into the	
	accumulator? a) MOV A, P2		b) MOV A, #27H		
	c) MOV A, 27		d) MOV A, @27		
5)	When the 805	1 is reset and the EA lin	e is LOW, the progra	m counter points to the	
	. •	nstruction in the			
	a) Internal co	ae memory ode memory	<ul><li>b) Internal data r</li><li>d) External data</li></ul>	•	
6)	,	evices bit	,	•	
٠,		gram memory.	program ocamic car	raine or distance on ig	
		b) 16, 64 K × 8			
7)		ion of ANDLW $0 \times 5f$ to	the working register of	contents were O × A3.	
	a) 0 × 5f	after execution will be b) $O \times 03$	c) O×FF	d) None of these	
8)	,	s been pushed eight tin	,	,	
0)		oss of pushed data	ioo, ano minar paori io		
	b) Sets stack	overflow bit			

c) Overwrites the value that was stored from the first pushd) Overwrites the value that was stored from the last push



9)	Interrupt flag bit get sits corresponding en a) True for maskabl c) False for all interest	able bit or global er e interrupts only	nab b)	le bit the stateme	nt is	8
10)	RTC DS1307 suppo a) I2C	rt pro b) SPI	otoc c)	ol. PSP	d)	All of the above
11)	How many bytes of F data?	,	,		,	
	a) 8 byte	b) 56 byte	c)	7 byte	d)	128 byte
12)	In capture mode whi	ch timer is used?				
	a) Timer 0	b) Timer 1	c)	Timer 2	d)	Timer 3
13)	In compare mode	is used	l.			
	a) Timer 0	b) Timer 1	c)	Timer 2	d)	Timer 3
14)	CCP means					
	a) Capture Control		-			PWM
,	c) Compare Control		a)	None of the above	ve	
15)	The PWM period is	specified by	<b>b</b> )			
	a) PR2 c) CCPCON		,	TMR2 None of the above	<b>/</b>	
16)	,	ويرزو و ويرا الزير وور	,			whathau bit O is
16)	The following progra high and then send t			•	ııne	whether bit 2 is
	READ : MOV A, P1					
	ANL A,#2H					
	CJNE A,#02H,REAL	)				
	MOV P3,#FFH			<b>.</b> .		
	a) True		,	False		
17)	Device pins XTAL1 a oscillator or crystal.	nd XTAL2 for the 80	51 a	are used for conne	ectio	ons to an external
	a) True		b)	False		
18)	The total external da	ta memory that can	be	interfaced to the	805	51 is
	a) 32 K	b) 64 K	c)	128 K	d)	256 K
19)	The 8051 has	parallel I/O	ро	rts.		
,	a) 2	b) 3	c)		d)	5
20)	How many timers av	ailable in 8051 ?				
•	a) 2	b) 8	c)	4	d)	6



Seat	
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# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MICROCONTROLLER AND APPLICATIONS

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

2) Assume suitable data if necessary.

## 2. Attempt any four:

 $(4 \times 5 = 20)$ 

- 1) Write a program in assembly or "C" language to generate a square wave of 1 KHz with 50% duty cycle on P1.5 pin of 8051 microcontroller. Use timer 0 to generate the delay.
- 2) Describe serial modes of 8051 microcontroller.
- 3) Explain the ports of 8051 microcontroller used for external memory access.
- 4) Draw and explain the formats of SFR□s
  - 1) SCON
  - 2) PCON.
- 5) Draw pin-out of 14 pin LCD display and state the functions of
  - 1) RS
  - 2) EN
  - 3) R/W.

### 3. Attempt any two:

 $(2\times10=20)$ 

- 1) Write assembly or "C" language program to transfer the message "SOLAPUR" serially at baud rate 4800, 8 bit data and 1 stop bit.
- 2) Draw the labeled diagram of interfacing DAC with 8051 microcontroller. Write a program in assembly or "C" language to generate a saw-tooth waveform.
- 3) What are the steps in executing an interrupts? Explain in detail all the six interrupts in 8051.



### 4. Answer any four:

 $(4 \times 5 = 20)$ 

- 1) Explain A/D conversion in PIC16F877.
- 2) Explain logical instruction related to PIC.
- 3) Explain how data is transferred using inter integrated circuit bus.
- 4) Write a note on watchdog timer.
- 5) List the feature of PIC microcontroller.
- 6) Explain interrupts in PIC 16F877.

### 5. Answer any two:

 $(2 \times 10 = 20)$ 

- 1) Explain in details I<sup>2</sup>C module. Explain how to initialize MSSP module in I<sup>2</sup>C mode.
- 2) Explain PCON, OPTION and STATUS registers of 16F877 and explain memory mapping in it.
- 3) Explain the different memories available in PIC 16F877.

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		• • • • • • •	Examination, 201 INS AND SYSTEM	
	e : Wednesday a.m. to 1.00 p	v, 23-11-2016		Max. Marks : 100
Instru	2) Fi 3) <b>A</b> 4) Q Ai 5) <b>A</b>	nswer Book Page N <b>nswer MCQ/Objec</b>	ndicate full marks. a if necessary. ary. It should be solve lo. 3. Each question tive type questions	ed in <b>first 30 minutes</b> in carries <b>one</b> mark. s on Page No. 3 only. R/S) on Top of Page.
Duration : 30 l	Minutes	MCQ/Objective T	ype Questions	Marks : 20
	he correct answ			20
´ A) O	perating voltag verload capaci	a thyristor effects its e ty	B) Operating frequ D) Thermal behavi	
i) DI ii) DI vo iii) DI	IAC is a two elo IAC can be swif oltage IAC exhibits ne	ng statements: ectrode, bidirectiona tched from OFF state egative resistance policy for triggering a	e to ON state for eith roperty	ner polarity of applied
,	se statements,	the following are co	orrect	
,		,	C) i, iii and iv ng angle $\alpha=0$ , the c	D) All of the above lc output voltage is
•	• .	~	C) $\sqrt{2} V_{\rm m}/\pi$	
4) In a s and a voltaç	 ingle phase full amplitude of in ge is about	wave converter with out voltage to each	n freewheel diode, w	ith firing angle of 60°, volts, the dc output
A) AI B) Ro C) AI	I rectifying eler ectifying eleme	_	6	
diode A) po		direction of vo e		



A) Anode voltage	ed by changing B) Anode current D) Gate current		
In a PLL frequency synthesizer, a value 999 in a single steps increment with f <sub>in</sub> soutput?  A) 1 KHz to 999 KHz in 1 KHz increme B) 10 KHz to 9990 KHz in 1 KHz increme	= 1 KHz. What is the nts nents		
,			
,	v power consumption		
IC 1596 is a A) Frequency counter C) Low signal amplifier	, -		
Which of following temperature sensor I A) LM35 C) PT100	•		
In XR 2240 if both trigger and reset sign A) Trigger is activated C) Both (A) and (B)			
following measurement?			
A high level signal on display select inp	ut, display output of	,	
Which of the following characteristics are	, , , , , ,	,	
A) High input impedance	B) High CMRR D) None of these		
Which of the following is self-powered to	emperature sensor ?	D) LM 35	
The first instruction on the rung must alv A) Input instruction C) (A) or (B)		n	
For input voltage range of 0-2V, $t_2 = 200$	00, required DVM dis	splay is	
A) 2 digit B) 3 digit	C) $3\frac{1}{2}$ digit	D) 4 digit	
<u> </u>		D) $V_e = V_{PV} * V_{SP}$	
·	unt frequency 1 MHz	with 1 Hz accuracy	
A) 3 B) 4	C) 5	D) 6	et P
	A) Anode voltage C) Forward current rating In a PLL frequency synthesizer, a value 999 in a single steps increment with fin soutput? A) 1 KHz to 999 KHz in 1 KHz increme B) 10 KHz to 9990 KHz in 1 KHz increme C) 10 KHz to 9990 KHz in 1 KHz increme D) 1 KHz to 9990 KHz in 1 KHz increme Which of the following PLL has very low A) 565 B) 4046 IC 1596 is a A) Frequency counter C) Low signal amplifier Which of following temperature sensor Inc. A) LM35 C) PT100 In XR 2240 if both trigger and reset signed A) Trigger is activated C) Both (A) and (B) Divide by 2 network is used in the path following measurement? A) Frequency B) Time period A high level signal on display select inperiod A high level signal on display select inperiod A high level signal on display select inperiod A) Latches B) Counters Which of the following characteristics are amplifier? A) High input impedance C) Both (A) and (B) Which of the following is self-powered to an amplifier instruction on the rung must alw A) Input instruction C) (A) or (B) For input voltage range of 0-2V, t <sub>2</sub> = 200 A) 2 digit B) 3 digit In ON-OFF controller, error voltage (V <sub>e</sub> ) A) V <sub>e</sub> = V <sub>SP</sub> + V <sub>PV</sub> B) V <sub>e</sub> = V <sub>SP</sub> - V <sub>PV</sub> The number of displays required to cook using IC74926 are	C) Forward current rating D) Gate current In a PLL frequency synthesizer, a value of divide-by-N netwo 999 in a single steps increment with $f_{\rm in} = 1$ KHz. What is the output?  A) 1 KHz to 999 KHz in 1 KHz increments B) 10 KHz to 9990 KHz in 1 KHz increments C) 10 KHz to 9990 KHz in 1 KHz increments D) 1 KHz to 9990 KHz in 1 KHz increments Which of the following PLL has very low power consumptior A) 565 B) 4046 C) Both (A) and (B) IC 1596 is a A) Frequency counter B) Digital voltmeter C) Low signal amplifier D) Balanced modul Which of following temperature sensor has sensitivity 10 mV A) LM35 B) J-type thermoco C) PT100 D) None of above In XR 2240 if both trigger and reset signal are applied simulf A) Trigger is activated B) Reset is activated C) Both (A) and (B) D) Can't say Divide by 2 network is used in the path of low frequency sign following measurement? A) Frequency B) Time period C) Both (A) and (B) A high level signal on display select input, display output of A) Latches B) Counters C) Both (A) and (B) Which of the following characteristics are required for selectic amplifier? A) High input impedance B) High CMRR C) Both (A) and (B) D) None of these Which of the following is self-powered temperature sensor? A) Thermocouple B) Thermistor C) RTD The first instruction on the rung must always be an A) Input instruction B) Output instruction C) (A) or (B) D) All of these For input voltage range of 0-2V, $t_2 = 2000$ , required DVM dis A) 2 digit B) 3 digit C) $3\frac{1}{2}$ digit In ON-OFF controller, error voltage ( $V_e$ ) is given by A) $V_e = V_{SP} + V_{PV}$ B) $V_e = V_{SP} - V_{PV}$ C) $V_e = V_{PV} - V_{SP}$ The number of displays required to count frequency 1 MHz using IC74926 are	A) Anode voltage C) Forward current rating D) Gate current In a PLL frequency synthesizer, a value of divide-by-N network varies from 10 to 999 in a single steps increment with f <sub>in</sub> = 1 KHz. What is the value of synthesizer output? A) 1 KHz to 999 KHz in 1 KHz increments B) 10 KHz to 9990 KHz in 1 KHz increments C) 10 KHz to 9990 KHz in 1 KHz increments Which of the following PLL has very low power consumption? A) 565 B) 4046 C) Both (A) and (B) D) None of these IC 1596 is A) Frequency counter C) Low signal amplifier D) Balanced modulator-demodulator Which of following temperature sensor has sensitivity 10 mV/°C? A) LM35 B) J-type thermocouple C) PT100 D) None of above In XR 2240 if both trigger and reset signal are applied simultaneously then A) Trigger is activated B) Reset is activated C) Both (A) and (B) D) Can't say Divide by 2 network is used in the path of low frequency signal in which of following measurement? A) Frequency B) Time period C) Both (A) and (B) D) None of these Which of the following characteristics are required for selection of instrumentation amplifier? A) High input impedance B) High CMRR C) Both (A) and (B) D) None of these Which of the following is self-powered temperature sensor? A) Thermocouple B) Thermistor C) RTD D) LM 35 The first instruction on the rung must always be an A) Input instruction C) (A) or (B) D) Al digit D) 4 digit In ON-OFF controller, error voltage (V <sub>e</sub> ) is given by A) V <sub>e</sub> = V <sub>SP</sub> + V <sub>PV</sub> B) V <sub>e</sub> = V <sub>SP</sub> - V <sub>PV</sub> C) V <sub>e</sub> = V <sub>PV</sub> - V <sub>SP</sub> D) V <sub>e</sub> = V <sub>PV</sub> * V <sub>SP</sub> The number of displays required to count frequency 1 MHz with 1 Hz accuracy using IC74926 are A) 3 B) 4



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# T.E. (E & TC) (Part – II) Examination, 2016 ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

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

#### SECTION - I

#### II. Answer any four:

20

- i) Explain two transistor analogy of an SCR.
- ii) Discuss the construction of TRIAC and with V-I characteristics, explain its working.
- iii) Explain the working of balanced modulator IC 1596 with neat circuit diagram.
- iv) How AC power control is achieved using DIAC and TRIAC for lamp dimmer?
- v) Write a note on dielectric heating.

#### III. A) Answer any one:

10

- i) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load and freewheeling diode. Derive an expression for average load voltage, current and RMS load voltage.
- ii) Design a frequency synthesizer using PLL CD 4046 to generate a frequency of 1 KHz to 999 KHz. Use 4.43 MHz crystal.
- B) Design a frequency synthesizer using PLL 565 to obtain 100 KHz frequency signal using 50 Hz AC mains as input.

10

#### SECTION - II

#### IV. Attempt any three:

- 1) Compare thermocouple and RTD.
- 2) Design a timer using XR2240 to generate a delay of 220 seconds.
- 3) Design a zero and span circuit to convert input voltage range of –3.5 V to 3.5V into 0 to 10 V.
- 4) Draw and explain PLC architecture.



#### V. Attempt any two:

15

1) Design a proportional controller to control pressure in the range of 2 psi to 15 psi.

Set point: 10 psi

Proportional band: 25%

Assume the sensitivity is 10 mV/psi

- 2) Draw and explain ladder diagram for bottle filling plant system.
- 3) Design an ON-OFF temperature controller for temperature range of 0°C to 500°C. Set point must be adjustable between 200°C to 300°C with dead band 10°C. Use J type thermocouple.

#### VI. Attempt any one:

10

- 1) Design a frequency measurement set up to measure frequency up to 10 MHz with 0.1 Hz accuracy. Use IC 74926.
- 2) Design a  $3\frac{1}{2}$  digit DVM for measurement of  $V_{in} = \pm 2V$ .

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		T.E. (E & TC) (Par	rt – II) Examination,	2016
	ELEC	TRONICS APPLIC	ATIONS AND SYSTE	EM DESIGN
	d Date : Wedn 10.00 a.m. to 1	esday, 23-11-2016 I.00 p.m.		Max. Marks: 100
	Instructions :	3) Assume suitab 4) Q. No. 1 is com Answer Book P 5) Answer MCQ/0	<b>ight</b> indicate full marks le data if necessary. <b>pulsory</b> . It should be so age No. <b>3. Each</b> quest <b>Objective type questi</b>	olved in <b>first 30 minutes</b> in
		MCQ/Objec	tive Type Questions	
Duration	n: 30 Minutes			Marks : 20
	oose the correc			20
1)		ollowing is self-powe uple B) Thermisto	ered temperature sense or C) RTD	or ? D) LM 35
2)	The first instru A) Input instru C) (A) or (B)	iction on the rung m iction	ust always be an B) Output instru D) All of these	ection
3)	For input volta	$_{2}$ ge range of 0-2V, $_{2}$	$\frac{1}{2}$ = 2000, required DVM	l display is
	A) 2 digit	B) 3 digit	C) $3\frac{1}{2}$ digit	D) 4 digit
4)		ntroller, error voltag - $V_{PV}$ B) $V_e = V_{SP}$ -	•	′ <sub>SP</sub> D) V <sub>e</sub> = V <sub>PV</sub> * V <sub>SP</sub>
5)	The number of using IC74926		to count frequency 1 N	MHz with 1 Hz accuracy
	A) 3	B) 4	C) 5	D) 6
6)		ne of a thyristor effeo voltage capacity		equency aviour
7)	<ul><li>i) DIAC is a f</li><li>ii) DIAC can b</li><li>voltage</li><li>iii) DIAC exhil</li></ul>	ollowing statements two electrode, bidire be switched from OF bits negative resista ed mainly for trigge	ectional avalanche dioc F state to ON state for nce property	le either polarity of applied
		nents, the following B) ii, iii and i	are correct	D) All of the above
8)	• .	_	for firing angle $\alpha$ = 0, the	•
	A) V/π	B) 2 V /π	C) √2 V/π	D) V/√2 π



9)	<ul> <li>In a single phase full wave converter with free and amplitude of input voltage to each thyr voltage is about</li> </ul>	
	A) $100/\pi$ Volts B) $150/\pi$ Volts C) 5	50/π Volts D) 150 Volts
10)	<ul> <li>A fully controlled converter implies a convert</li> <li>A) All rectifying elements are pn diodes</li> <li>B) Rectifying elements are both thyristors ar</li> <li>C) All rectifying elements are thyristors or po</li> <li>D) Freewheeling diode is used</li> </ul>	er in which
11)	, , , , , , , ,	· ·
12)	,	y changing Anode current Gate current
13)	<ul> <li>In a PLL frequency synthesizer, a value of di 999 in a single steps increment with f<sub>in</sub> = 1 K output?</li> <li>A) 1 KHz to 999 KHz in 1 KHz increments</li> <li>B) 10 KHz to 9990 KHz in 1 KHz increments</li> <li>C) 10 KHz to 9990 KHz in 1 KHz increments</li> <li>D) 1 KHz to 9990 KHz in 1 KHz increments</li> </ul>	Hz. What is the value of synthesizer
Í		ver consumption ? Both (A) and (B) D) None of these
15)	, , ,	Digital voltmeter Balanced modulator-demodulator
16)		ensitivity 10 mV/°C ? J-type thermocouple None of above
17)	, 33	e applied simultaneously then Reset is activated Can't say
18)	<ul><li>B) Divide by 2 network is used in the path of low following measurement?</li><li>A) Frequency</li><li>B) Time period</li><li>C) In the period</li></ul>	w frequency signal in which of  Both (A) and (B) D) None of these
	·	Both (A) and (B) D) None of these
20)	Which of the following characteristics are requamplifier?	uired for selection of instrumentation
	A) High input impedance B) H	High CMRR None of these



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## T.E. (E & TC) (Part – II) Examination, 2016 ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

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

#### SECTION - I

#### II. Answer any four:

20

- i) Explain two transistor analogy of an SCR.
- ii) Discuss the construction of TRIAC and with V-I characteristics, explain its working.
- iii) Explain the working of balanced modulator IC 1596 with neat circuit diagram.
- iv) How AC power control is achieved using DIAC and TRIAC for lamp dimmer?
- v) Write a note on dielectric heating.

#### III. A) Answer any one:

10

- i) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load and freewheeling diode. Derive an expression for average load voltage, current and RMS load voltage.
- ii) Design a frequency synthesizer using PLL CD 4046 to generate a frequency of 1 KHz to 999 KHz. Use 4.43 MHz crystal.
- B) Design a frequency synthesizer using PLL 565 to obtain 100 KHz frequency signal using 50 Hz AC mains as input.

10

#### SECTION - II

#### IV. Attempt any three:

- 1) Compare thermocouple and RTD.
- 2) Design a timer using XR2240 to generate a delay of 220 seconds.
- 3) Design a zero and span circuit to convert input voltage range of –3.5 V to 3.5V into 0 to 10 V.
- 4) Draw and explain PLC architecture.



#### V. Attempt any two:

15

1) Design a proportional controller to control pressure in the range of 2 psi to 15 psi.

Set point: 10 psi

Proportional band: 25%

Assume the sensitivity is 10 mV/psi

- 2) Draw and explain ladder diagram for bottle filling plant system.
- 3) Design an ON-OFF temperature controller for temperature range of 0°C to 500°C. Set point must be adjustable between 200°C to 300°C with dead band 10°C. Use J type thermocouple.

#### VI. Attempt any one:

- 1) Design a frequency measurement set up to measure frequency up to 10 MHz with 0.1 Hz accuracy. Use IC 74926.
- 2) Design a  $3\frac{1}{2}$  digit DVM for measurement of  $V_{in} = \pm 2V$ .


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	ELEC	T.E. (E & TC)	. ,				SIGN	
	d Date : Wedn 10.00 a.m. to	esday, 23-11-2 1.00 p.m.	2016				Max. Marks : 1	00
	Instructions :	Answer Boo 5) <b>Answer M</b> o	the <b>right</b> indi uitable data i compulsory ok Page No. <b>CQ/Objectiv</b>	icate fui if neces r. It shou <b>3. Eac</b> re type	ll marks. sary. uld be solve <b>h</b> question <b>questions</b>	carr <b>on</b>	first 30 minutes ir ies one mark. Page No. 3 only on Top of Page.	
Domatic		MCQ/OI	ojective Typ	e Ques	stions		N.A. autono	00
	n : 30 Minutes						Marks:	
_	oose the correc		•					20
1)	Which of follow A) LM35 C) PT100	wing temperatur	В	) J-typ	tivity 10 mV e thermoco e of above			
2)	In XR 2240 if A) Trigger is a C) Both (A) a		В		t is activate		ously then	
3)	Divide by 2 ne following mea A) Frequency						n which of  None of these	
4)	,	ignal on display B) Cour	select input,	, displa	y output of	,	None of these	
5)	amplifier?	J		•		on of	finstrumentation	
	A) High input C) Both (A) a	nd (B)	D	) None	CMRR of these			
	A) Thermoco	ollowing is self-puple B) Theri	mistor C	RTD			LM 35	
7)	The first instru  A) Input instru  C) (A) or (B)	uction on the run uction	В	-	ut instructio	n		
8)	For input volta	age range of 0-2	$V, t_2 = 2000$	, requir	ed DVM dis	play	/ is	
	A) 2 digit	B) 3 dig	it C	$3\frac{1}{2}$	digit	D)	4 digit	
9)		ontroller, error vo + V <sub>PV</sub> B) V <sub>e</sub> =				D)		·.o.



10)	The number of displays required to couusing IC74926 are	unt f	requency 1 MHz	witl	h 1 Hz accuracy
	A) 3 B) 4	C)	5	D)	6
11)	The turn-off time of a thyristor effects its A) Operating voltage C) Overload capacity	B)	Operating freque Thermal behavior	ency	
12)	<ul> <li>Consider the following statements:</li> <li>i) DIAC is a two electrode, bidirectiona</li> <li>ii) DIAC can be switched from OFF stat voltage</li> <li>iii) DIAC exhibits negative resistance points</li> </ul>	te to rope	ON state for eith erty	er p	olarity of applied
	iv) DIAC is used mainly for triggering a				
	Of these statements, the following are co A) i, ii and iii B) ii, iii and iv			D)	All of the above
13)	In a single phase bridge converter, for firir				
	A) $V_m/\pi$ B) $2 V_m/\pi$				
14)	In a single phase full wave converter with and amplitude of input voltage to each voltage is about				
	A) $100/\pi$ Volts B) $150/\pi$ Volts	C)	50/ $\pi$ Volts	D)	150 Volts
15)	<ul> <li>A fully controlled converter implies a converter.</li> <li>A) All rectifying elements are pn diodes.</li> <li>B) Rectifying elements are both thyristom.</li> <li>C) All rectifying elements are thyristoms.</li> <li>D) Freewheeling diode is used.</li> </ul>	s ors a	and diodes		
16)	A single phase fully controlled converter validode provides direction of val.  A) positive, negative  C) negative, negative	oltaç B)	• •	dii e	_
17)	<ul><li>In SCR angle of conduction can be vari</li><li>A) Anode voltage</li><li>C) Forward current rating</li></ul>	_ \			
18)	In a PLL frequency synthesizer, a value 999 in a single steps increment with f <sub>in</sub> = output?  A) 1 KHz to 999 KHz in 1 KHz increment B) 10 KHz to 9990 KHz in 1 KHz increment C) 10 KHz to 9990 KHz in 1 KHz increment C) 1 KHz to 9990 KHz in 1 KHz increment C) 1 KHz to 9990 KHz in 1 KHz increment C)	e of one of the office of the	divide-by-N netwookHz. What is the		
19)	Which of the following PLL has very low	•	•		
	A) 565 B) 4046	C)	Both (A) and (B)	D)	None of these
20)	IC 1596 is a A) Frequency counter C) Low signal amplifier		Digital voltmeter Balanced modul		r-demodulator



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## T.E. (E & TC) (Part – II) Examination, 2016 ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

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

#### SECTION - I

#### II. Answer any four:

20

- i) Explain two transistor analogy of an SCR.
- ii) Discuss the construction of TRIAC and with V-I characteristics, explain its working.
- iii) Explain the working of balanced modulator IC 1596 with neat circuit diagram.
- iv) How AC power control is achieved using DIAC and TRIAC for lamp dimmer?
- v) Write a note on dielectric heating.

#### III. A) Answer any one:

10

- i) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load and freewheeling diode. Derive an expression for average load voltage, current and RMS load voltage.
- ii) Design a frequency synthesizer using PLL CD 4046 to generate a frequency of 1 KHz to 999 KHz. Use 4.43 MHz crystal.
- B) Design a frequency synthesizer using PLL 565 to obtain 100 KHz frequency signal using 50 Hz AC mains as input.

10

#### SECTION - II

#### IV. Attempt any three:

15

- 1) Compare thermocouple and RTD.
- 2) Design a timer using XR2240 to generate a delay of 220 seconds.
- 3) Design a zero and span circuit to convert input voltage range of –3.5 V to 3.5V into 0 to 10 V.
- 4) Draw and explain PLC architecture.

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#### V. Attempt any two:

15

1) Design a proportional controller to control pressure in the range of 2 psi to 15 psi.

Set point: 10 psi

Proportional band: 25%

Assume the sensitivity is 10 mV/psi

- 2) Draw and explain ladder diagram for bottle filling plant system.
- 3) Design an ON-OFF temperature controller for temperature range of 0°C to 500°C. Set point must be adjustable between 200°C to 300°C with dead band 10°C. Use J type thermocouple.

#### VI. Attempt any one:

- 1) Design a frequency measurement set up to measure frequency up to 10 MHz with 0.1 Hz accuracy. Use IC 74926.
- 2) Design a  $3\frac{1}{2}$  digit DVM for measurement of  $V_{in} = \pm 2V$ .


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	T.E. (E & TC) (Part – II ELECTRONICS APPLICATION	-	GN
	d Date : Wednesday, 23-11-2016 10.00 a.m. to 1.00 p.m.		Max. Marks: 100
1	Answer Book Page N 5) <b>Answer MCQ/Objec</b>	ndicate full marks.	s <b>one</b> mark. P <b>age No. 3 only.</b>
Duration	MCQ/Objective T n : 30 Minutes	ype Questions	Marks : 20
I. Ch	oose the correct answer :		20
2)	A single phase fully controlled converter diode provides direction of v A) positive, negative C) negative, negative In SCR angle of conduction can be var A) Anode voltage C) Forward current rating In a PLL frequency synthesizer, a value 999 in a single steps increment with fin output? A) 1 KHz to 999 KHz in 1 KHz increment b) 10 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b) 1 KHz to 9990 KHz in 1 KHz increment b)	oltage and direct B) positive, positive D) negative, positive ied by changing B) Anode current D) Gate current e of divide-by-N network va = 1 KHz. What is the value ents ments ments ments ments ments ments	ction of current.
·	Which of the following PLL has very lov A) 565 B) 4046 IC 1596 is a	w power consumption ? C) Both (A) and (B) D) N	one of these
,	<ul><li>A) Frequency counter</li><li>C) Low signal amplifier</li></ul>	B) Digital voltmeter D) Balanced modulator-d	lemodulator
6)	Which of following temperature sensor A) LM35 C) PT100	has sensitivity 10 mV/°C?  B) J-type thermocouple  D) None of above	
7)	In XR 2240 if both trigger and reset sig A) Trigger is activated C) Both (A) and (B)	nal are applied simultaneou B) Reset is activated D) Can't sav	usly then



8)	Divide by 2 network following measurem	ent?		
	A) Frequency	, .	C) Both (A) and (B)	,
9)	A high level signal o  A) Latches		out, display output of C) Both (A) and (B)	
10)		g characteristics are	e required for selecti	on of instrumentation
	amplifier?		_,	
	<ul><li>A) High input imped</li><li>C) Both (A) and (B)</li></ul>	dance	<ul><li>B) High CMRR</li><li>D) None of these</li></ul>	
11)	Which of the following A) Thermocouple	•	-	? D) LM 35
12)	The first instruction of A) Input instruction C) (A) or (B)	on the rung must alv	ways be an  B) Output instruction  D) All of these	on
13)	For input voltage rar	nge of 0-2V, $t_2 = 200$	00, required DVM dis	splay is
,		<del>-</del>	_	
	A) 2 digit	B) 3 digit	C) $3\frac{1}{2}$ digit	D) 4 digit
14)	In ON-OFF controlle	r, error voltage (V <sub>e</sub> )	is given by	
	A) $V_e = V_{SP} + V_{PV}$	B) $V_e = V_{SP} - V_{PV}$	C) $V_e = V_{PV} - V_{SP}$	D) $V_e = V_{PV} * V_{SP}$
15)	The number of displusing IC74926 are	lays required to cou	unt frequency 1 MHz	z with 1 Hz accuracy
	•	B) 4	C) 5	D) 6
16)	A) 3	B) 4 a thyristor effects its	C) 5	D) 6
16)	•	thyristor effects its	<ul><li>C) 5</li><li>B) Operating frequ</li><li>D) Thermal behavi</li></ul>	ency
•	A) 3 The turn-off time of a A) Operating voltag C) Overload capacit Consider the followin i) DIAC is a two ele ii) DIAC can be swit	a thyristor effects its e ty ng statements : ectrode, bidirections	B) Operating frequ D) Thermal behavi al avalanche diode	ency
•	<ul> <li>A) 3</li> <li>The turn-off time of a</li> <li>A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the following</li> <li>i) DIAC is a two elements</li> </ul>	a thyristor effects its e ty ng statements : ectrode, bidirectiona tched from OFF stat	B) Operating frequ D) Thermal behavi al avalanche diode te to ON state for eith	ency our
17)	A) 3 The turn-off time of a A) Operating voltag C) Overload capacit Consider the following i) DIAC is a two elements ii) DIAC can be swith voltage iii) DIAC exhibits neiv) DIAC is used match of these statements,	a thyristor effects its e ty ng statements : ectrode, bidirectiona tched from OFF state gative resistance painly for triggering a the following are co	B) Operating frequ D) Thermal behavi al avalanche diode te to ON state for eith roperty TRIAC	ency our
17)	A) 3 The turn-off time of a A) Operating voltag C) Overload capacit Consider the following i) DIAC is a two elements ii) DIAC can be swith voltage iii) DIAC exhibits neiv) DIAC is used match of these statements,	a thyristor effects its e by ng statements : ectrode, bidirectionatched from OFF state egative resistance painly for triggering a the following are constants.	B) Operating freques D) Thermal behavioral avalanche diode te to ON state for either TRIAC Dirrect C) i, iii and iv	ency our ner polarity of applied  D) All of the above
17)	A) 3 The turn-off time of a A) Operating voltag C) Overload capacit Consider the following i) DIAC is a two elements ii) DIAC can be swith voltage iii) DIAC exhibits neiv) DIAC is used match of these statements, A) i, ii and iii In a single phase brid	a thyristor effects its e ty ng statements: ectrode, bidirectionatched from OFF states and for triggering a the following are completed by ii, iii and iv	B) Operating frequency D) Thermal behavioral avalanche diode te to ON state for either TRIAC Direct C) i, iii and iverse angle $\alpha=0$ , the constant of the con	ency our ner polarity of applied  D) All of the above dc output voltage is
17)	<ul> <li>A) 3</li> <li>The turn-off time of a A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the following</li> <li>i) DIAC is a two elements</li> <li>ii) DIAC exhibits need iv) DIAC is used material</li> <li>Of these statements</li> <li>A) i, ii and iii</li> <li>In a single phase brid</li> <li>A) V<sub>m</sub>/π</li> </ul>	a thyristor effects its e ty ng statements: ectrode, bidirectionatched from OFF states at the following are companied by ii, iii and iv lge converter, for firing B) 2 V <sub>m</sub> /π	B) Operating frequency D) Thermal behavioral avalanche diode te to ON state for either TRIAC Direct C) i, iii and ivers angle $\alpha = 0$ , the condition of $\alpha = 0$ , the condition of $\alpha = 0$ , the condition of $\alpha = 0$ .	ency our ner polarity of applied  D) All of the above dc output voltage is
17)	<ul> <li>A) 3</li> <li>The turn-off time of a A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the following</li> <li>i) DIAC is a two elegit</li> <li>ii) DIAC can be swith voltage</li> <li>iii) DIAC exhibits negit</li> <li>iv) DIAC is used material of these statements,</li> <li>A) i, ii and iii</li> <li>In a single phase brid</li> <li>A) V<sub>m</sub>/π</li> <li>In a single phase full and amplitude of ing</li> </ul>	a thyristor effects its e ty hg statements: ectrode, bidirectionatched from OFF states and the following are compared by ii, iii and iv lge converter, for firing a wave converter with	B) Operating frequency D) Thermal behavioral avalanche diode te to ON state for either TRIAC Description of the total $\alpha$ and	ency our ner polarity of applied  D) All of the above dc output voltage is  D) $V_m/\sqrt{2}\pi$
17)	A) 3 The turn-off time of a A) Operating voltag C) Overload capacit Consider the following i) DIAC is a two elements ii) DIAC can be swith voltage iii) DIAC exhibits neivoltage iii) DIAC is used match of these statements, A) i, ii and iii In a single phase brid A) V <sub>m</sub> /π In a single phase full and amplitude of inpolarity voltage is about	a thyristor effects its e by high statements: ectrode, bidirectionatched from OFF states and the following are compared by ii, iii and ivolge converter, for firing wave converter without voltage to each	B) Operating frequency D) Thermal behavioral avalanche diode the to ON state for either TRIAC Direct C) i, iii and iveraging angle $\alpha = 0$ , the conditional content of the freewheel diode, we athyristor $V_m$ of 100 the conditional content of the conditional content of the conditional content of the conditional conditional content of the conditional content of the conditional conditional conditional content of the conditional conditio	ency our ner polarity of applied  D) All of the above dc output voltage is D) $V_m/\sqrt{2\pi}$ ith firing angle of 60°, o volts, the dc output
117) 118)	<ul> <li>A) 3</li> <li>The turn-off time of a A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the following</li> <li>i) DIAC is a two elements</li> <li>ii) DIAC exhibits need in the initial of these statements</li> <li>A) I, ii and iii</li> <li>In a single phase bride</li> <li>A) V<sub>m</sub>/π</li> <li>In a single phase full and amplitude of inpostage is about</li> <li>A) 100/π Volts</li> </ul>	a thyristor effects its e by high statements: ectrode, bidirectionatched from OFF states and the following are compared by ii, iii and iv lige converter, for firing a vave converter with out voltage to each $150/\pi$ Volts	B) Operating frequency D) Thermal behavioral avalanche diode te to ON state for either to TRIAC District C) i, iii and ivergence $\alpha = 0$ , the condition of $\alpha = 0$ , the condition of $\alpha = 0$ , the freewheel diode, we atheristor $\alpha = 0$ .	ency our ner polarity of applied  D) All of the above dc output voltage is  D) $V_m/\sqrt{2\pi}$ ith firing angle of 60°,
117) 118)	<ul> <li>A) 3</li> <li>The turn-off time of a A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the followin</li> <li>i) DIAC is a two ele</li> <li>ii) DIAC can be swith voltage</li> <li>iii) DIAC exhibits ne</li> <li>iv) DIAC is used ma</li> <li>Of these statements,</li> <li>A) i, ii and iii</li> <li>In a single phase brid</li> <li>A) V<sub>m</sub>/π</li> <li>In a single phase full and amplitude of inpolation voltage is about</li> <li>A) 100/π Volts</li> <li>A fully controlled con</li> </ul>	a thyristor effects its e by hg statements: ectrode, bidirectionatched from OFF states and the following are compared by ii, iii and iv lige converter, for firing B) $2 V_m / \pi$ wave converter without voltage to each B) $150/\pi$ Volts everter implies a co	B) Operating frequency D) Thermal behavioral avalanche diode te to ON state for either TRIAC Direct C) i, iii and ivergency angle $\alpha=0$ , the confidence of	ency our ner polarity of applied  D) All of the above dc output voltage is D) $V_m/\sqrt{2\pi}$ ith firing angle of 60°, o volts, the dc output
117) 118)	<ul> <li>A) 3</li> <li>The turn-off time of a A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the following</li> <li>i) DIAC is a two elegit</li> <li>ii) DIAC can be swith voltage</li> <li>iii) DIAC exhibits negit</li> <li>iv) DIAC is used mand</li> <li>Of these statements,</li> <li>A) i, ii and iii</li> <li>In a single phase brid and amplitude of ing voltage is about</li> <li>A) 100/π Volts</li> <li>A fully controlled cort</li> <li>A) All rectifying eleme</li> <li>B) Rectifying eleme</li> </ul>	a thyristor effects its e by high statements: ectrode, bidirectional the distribution of the following are compared by the following are compared by $V_m/\pi$ wave converter without voltage to each $V_m/\pi$ by $V_m/\pi$ where $V_m/\pi$ wave converter without voltage to each $V_m/\pi$ by $V_m/\pi$ where $V_m/\pi$ wave converter without voltage to each $V_m/\pi$ where $V_m/\pi$ by $V_m/\pi$ where $V_m/\pi$ where $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ and $V_m/\pi$ is a substitution of the following and $V_m/\pi$ and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of the following and $V_m/\pi$ where $V_m/\pi$ is a substitution of $V_m/\pi$ and $V_m/\pi$ in the following and $V_m/\pi$ is a substitution of $V_m/\pi$ and $V_m/\pi$ and $V_m/\pi$ is a substitution of $V_m/\pi$ and $V_m/\pi$ in the following and $V_m/\pi$ is a substitution of $V_m/\pi$ and $V_m/\pi$ in the following and $V_m/\pi$ is a substitution of $V_m/\pi$ and $V_m/\pi$ in the following and $V_m/\pi$ is a substitution of $V_m/\pi$ and $V_m/\pi$ in the following and $V_m/\pi$ is a substitution of $V_m/\pi$ in the following and $V_m/\pi$	B) Operating frequency D) Thermal behavioral avalanche diode the to ON state for either operty TRIAC Direct C) i, iii and ivergence of the condition of the co	ency our ner polarity of applied  D) All of the above the output voltage is  D) $V_m/\sqrt{2\pi}$ ith firing angle of 60°, o volts, the dc output  D) 150 Volts
117) 118)	<ul> <li>A) 3</li> <li>The turn-off time of a A) Operating voltag</li> <li>C) Overload capacit</li> <li>Consider the followin</li> <li>i) DIAC is a two ele</li> <li>ii) DIAC can be swith voltage</li> <li>iii) DIAC exhibits ne</li> <li>iv) DIAC is used ma</li> <li>Of these statements,</li> <li>A) i, ii and iii</li> <li>In a single phase brid</li> <li>A) V<sub>m</sub>/π</li> <li>In a single phase full and amplitude of inpolation voltage is about</li> <li>A) 100/π Volts</li> <li>A fully controlled cor</li> <li>A) All rectifying eler</li> </ul>	a thyristor effects its e by ng statements: ectrode, bidirectional the distribution of the following are considered from OFF states and the following are considered from the following are considered from the following are considered from $B$ and $B$ are converter, for firing $B$ and $B$ are converter without voltage to each $B$ and $B$ are possible and $B$ are both thyristors are both thyristors.	B) Operating frequency D) Thermal behavioral avalanche diode the to ON state for either operty TRIAC Direct C) i, iii and ivergence of the condition of the co	ency our ner polarity of applied  D) All of the above the output voltage is  D) $V_m/\sqrt{2\pi}$ ith firing angle of 60°, o volts, the dc output  D) 150 Volts



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# T.E. (E & TC) (Part – II) Examination, 2016 ELECTRONICS APPLICATIONS AND SYSTEM DESIGN

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

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

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

#### SECTION - I

#### II. Answer any four:

20

- i) Explain two transistor analogy of an SCR.
- ii) Discuss the construction of TRIAC and with V-I characteristics, explain its working.
- iii) Explain the working of balanced modulator IC 1596 with neat circuit diagram.
- iv) How AC power control is achieved using DIAC and TRIAC for lamp dimmer?
- v) Write a note on dielectric heating.

#### III. A) Answer any one:

10

- i) With the help of circuit diagram and waveform explain single phase half wave controlled rectifier with inductive load and freewheeling diode. Derive an expression for average load voltage, current and RMS load voltage.
- ii) Design a frequency synthesizer using PLL CD 4046 to generate a frequency of 1 KHz to 999 KHz. Use 4.43 MHz crystal.
- B) Design a frequency synthesizer using PLL 565 to obtain 100 KHz frequency signal using 50 Hz AC mains as input.

10

#### SECTION - II

#### IV. Attempt any three:

- 1) Compare thermocouple and RTD.
- 2) Design a timer using XR2240 to generate a delay of 220 seconds.
- 3) Design a zero and span circuit to convert input voltage range of –3.5 V to 3.5V into 0 to 10 V.
- 4) Draw and explain PLC architecture.



#### V. Attempt any two:

15

1) Design a proportional controller to control pressure in the range of 2 psi to 15 psi.

Set point: 10 psi

Proportional band: 25%

Assume the sensitivity is 10 mV/psi

- 2) Draw and explain ladder diagram for bottle filling plant system.
- 3) Design an ON-OFF temperature controller for temperature range of 0°C to 500°C. Set point must be adjustable between 200°C to 300°C with dead band 10°C. Use J type thermocouple.

#### VI. Attempt any one:

- 1) Design a frequency measurement set up to measure frequency up to 10 MHz with 0.1 Hz accuracy. Use IC 74926.
- 2) Design a  $3\frac{1}{2}$  digit DVM for measurement of  $V_{in} = \pm 2V$ .


#### T.E. (E & TC) (Part – II) Examination, 2016 **OPTICAL COMMUNICATION**

Day and Date : Thursday,	, 24-11-2016	Max. Marks: 100
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Time: 10.00 a.m. to 1.00 p.m.

#### Instructions: • All questions are compulsory.

- Assume suitable data if required.
- Figures to right indicates full marks..
- Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

#### MCQ/Objective Type Questions

Duration: 30 Minutes	Marks: 20
1. Choose the correct answer :	(20×1=20)

- 1) The angles of incidence  $\phi_1$  and refraction  $\phi_2$  are related to each other and to the refractive indices of the dielectrics n<sub>1</sub> and n<sub>2</sub> and are given by Snell's law of refraction as
  - A)  $n_1 \sin \phi_1 = n_2 \sin \phi_2$

B)  $n_1 \cos \phi_1 = n_2 \cos \phi_2$ 

C)  $n_1 \cos \phi_2 = n_2 \cos \phi_1$ 

- D)  $n_1 \sin \phi_2 = n_2 \sin \phi_1$
- 2) The numerical aperture is a measure of
  - A) The light scattering ability of the fiber
- B) Dispersion of the fiber
- C) The light collecting ability of the fiber
- D) Attenuation of the fiber
- 3) Cutoff wavelength of an optical fiber is the wavelength
  - A) Above which the fiber becomes single moded
  - B) Below which the fiber becomes single moded
  - C) Above which no mode is supported
  - D) Below which no mode is supported
- 4) The mean optical power launched into an 8 km fiber is 120  $\mu$  W and the mean optical power at the output is  $3\mu$  W. The signal attenuation per km for the fiber is
  - A) 16 dB/km
- B) 8 dB/km
- C) 4 dB/km
- D) 2 dB/km

- 5) Macrobending losses can be avoided by
  - A) Operating at longest wavelengths possible
  - B) Designing the fibers with large relative refractive index differences
  - C) Designing the fibers with small relative refractive index differences
  - D) None of above
- 6) The Vapor Axial Deposition (VAD) process is
  - A) A batch process

- B) A continuous process
- C) Outside layer deposition process
- D) Inside layer deposition process
- 7) Star couplers are generally used for distributing a
  - A) Single input signal to multiple outputs
- B) Multiple input signals to single output
- C) Multiple input signal to multiple outputs D) None of these



8)	LASER is a			Chantanasus	<b>D</b> \	Name of these
٥)	A) Coherent	•	,	•	,	
9)	A GaAs injection LASE is 2.5 V and the bandg device is	ap energy of GaAs is	1.4	3 eV, the external	pow	er efficiency of the
	A) 10%	B) 31.47%	C)	3.18%	D)	9.71%
10)	<ul><li>Which of the following</li><li>A) Index guided LASE</li><li>C) Double hetero junc</li></ul>	ΕR	B)	injection LASER ? Gain guided LAS Distributed feedb	SER	LASER
11)	At 1.3 $\mu$ m wavelength dependence than the	surface emitter.				-
	A) Less	B) Moderate	•		•	
12)	A photodiode has a quincident upon it, then to A) 0.694		ph	otodiode is		y 1.8 × 10 <sup>–19</sup> J are
10\	,	_			,	
13)	The carrier velocities of the transit time is	or approximately 10'	CIII/	s of a depletion lay	er w	nain or το μm.
		B) 0.3 ns	C)	0.13 ns	D)	0.2 ns
14)	The optical power gen	•	•	is	,	
	A) $P_{int} = \eta_{int} \begin{pmatrix} ci/e  \end{pmatrix}$	B) $P_{int} = \eta_{int} \left( \frac{j}{e} \right) hf$	C)	$P_{int} = \eta_{int} \binom{ncj}{e} hf$	D)	$P_{int} = \eta_{int} \begin{pmatrix} i/e \end{pmatrix}$
15)	<ul><li>The common method f</li><li>A) Multimode optical f</li><li>C) Single graded inde</li></ul>	iber	B)	Single step index		cal fiber
16)	Which method is empl A) Transmitted light in C) Refracted light inte	terferometer	B)	neasurement ? Reflected light into Both A) and B)	erfei	rometer
17)	The LED can operate	atthan th		-		
	<ul><li>A) Higher current der</li><li>C) Higher power</li></ul>	nsity	,	Lower current de None of these	nsity	<i>'</i>
18)	The requirement of de A) High fidelity C) More numerical ap			Larger size All the above		
19)	The detail knowledge (A) Impulse response (C) Both A) and B)	of the refractive index	pro B)		se	
20)	The response of Avala A) The transit time of B) Diffusion time of ca C) Both A) and B) D) None of above	the carrier across the				



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#### T.E. (E & TC) (Part – II) Examination, 2016 OPTICAL COMMUNICATION

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

**Instructions**: • All questions are compulsory.

• Assume suitable data if required.

• Figures to right indicates full marks..

#### SECTION - I

2. A) Solve any three of the following:

 $(3 \times 4 = 12)$ 

- 1) Explain the general block diagram of an optical communication system.
- 2) Explain phase velocity and group velocity.
- 3) Explain Rayleigh scattering loss in optical fiber.
- 4) Explain different types of fiber alignment losses.
- B) A ruby laser contains a crystal of length 4 cm with a refractive index of 1.78. The peak emission wavelength from the device is  $0.55\,\mu$  m. Determine the number of longitudinal modes and their frequency separation.

3. A) Solve **any two** of the following:

 $(2 \times 6 = 12)$ 

8

- 1) Explain double crucible method of fiber drawing. What are its advantages and drawbacks?
- 2) Explain any two methods of mechanical splicing techniques used for splicing single optical fibers.
- Explain injection laser characteristics.
- B) Silica has an estimated fictive temperature of  $1400^{\circ}$ K with an isothermal compressibility of  $7\times10^{-11}$  m²/N. The refractive index and the photoelastic coefficient for silica are 1.46 and 0.286 respectively. Determine the theoretical attenuation in dB/Km due to fundamental Rayleigh scattering in silica at optical wavelength of  $1\,\mu$  m. Boltzmann's constant is  $1.381\times10^{-21}$  J/°K.



#### SECTION - II

4. a) Attempt any three questions:

 $(3 \times 4 = 12)$ 

- 1) Explain the different advantages and disadvantages of LED as compare to laser.
- 2) Explain the various parameters effecting the speed of response of detectors.
- 3) Explain the total fiber attenuation measurement.
- 4) The carrier velocity in a silicon p-i-n diode with  $25 \,\mu$  m depletion layer width is  $3 \times 10^4$  m/s. Determine the maximum response time for the device.
- b) Compare the electrical and optical bandwidths for an optical fiber communication system and develop a relationship between them.
- 5. a) Attempt any two questions:

 $(2 \times 6 = 12)$ 

8

- 1) Explain the principle of optical detector.
- 2) Explain the structure of surface emitting LED.
- 3) Explain in detail the transmitter design and its requirements.
- b) The radiative and non-radiative recombination life times of minority carriers in the active region of a double heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination life time and the power internally generated within the device when the peak emission wavelength is 0.9 µm at a device current of 40 mA.

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#### T.E. (E & TC) (Part – II) Examination, 2016 **OPTICAL COMMUNICATION**

Day and Date: Thursday, 24-11-2016 Max. Marks: 100

Time: 10.00 a.m. to 1.00 p.m.

Instructions: • All questions are compulsory.

C) The light collecting ability of the fiber

- Assume suitable data if required.
- Figures to right indicates full marks

	Book Page No. 3. Eac • Answer MCQ/Object	ry. It should be solved in first 30 minuch ch question carries one mark. Five type questions on Page No. 3 of LP. Set (P/Q/R/S) on Top of Page.	
	MCQ/Objective	Type Questions	
Duratio	on : 30 Minutes		Marks: 20
1. C	hoose the correct answer :		(20×1=20)
1	<ul><li>) Which method is employed for interferome</li><li>A) Transmitted light interferometer</li><li>C) Refracted light interferometer</li></ul>	etric measurement ? B) Reflected light interferometer D) Both A) and B)	
2	The LED can operate atthan     A) Higher current density     C) Higher power	the injection laser.  B) Lower current density  D) None of these	
3	<ul><li>B) The requirement of detector is</li><li>A) High fidelity</li><li>C) More numerical aperture</li></ul>	B) Larger size D) All the above	
2	<ul> <li>The detail knowledge of the refractive index</li> <li>A) Impulse response of fiber</li> <li>C) Both A) and B)</li> </ul>	ex profile enables the  B) Transient response  D) None of above	
Ę	<ul> <li>The response of Avalanche photodiode is</li> <li>A) The transit time of the carrier across the</li> <li>B) Diffusion time of carriers</li> <li>C) Both A) and B)</li> <li>D) None of above</li> </ul>		
6	The angles of incidence $\phi_1$ and refraction indices of the dielectrics $n_1$ and $n_2$ and are	• =	
	A) $n_1 \sin \phi_1 = n_2 \sin \phi_2$	B) $n_1 \cos \phi_1 = n_2 \cos \phi_2$	
	C) $n_1 \cos \phi_2 = n_2 \cos \phi_1$	D) $n_1 \sin \phi_2 = n_2 \sin \phi_1$	
7	<ul> <li>The numerical aperture is a measure of</li> <li>A) The light scattering ability of the fiber</li> </ul>	B) Dispersion of the fiber	

D) Attenuation of the fiber



8)	Cutoff wavelength of a A) Above which the fi B) Below which the fil C) Above which no m D) Below which no m	ber becomes single roper becomes single mode is supported	nod	ed		
9)	The mean optical power at the output is A) 16 dB/km		enua	•	fibe	· · · · · · · · · · · · · · · · · · ·
10)	Macrobending losses A) Operating at longe B) Designing the fiber C) Designing the fiber D) None of above	st wavelengths possi s with large relative r	efra			
11)	The Vapor Axial Depo A) A batch process C) Outside layer depo	· · · ·	B)	A continuous pro- Inside layer depo		
12)	Star couplers are gene A) Single input signal C) Multiple input signal	to multiple outputs	B)	Multiple input sign	als '	to single output
13)	LASER is aA) Coherent	* *		Spontaneous	D)	None of these
14)	A GaAs injection LASE is 2.5 V and the bandg device is	ap energy of GaAs is	1.4	3 eV, the external	pow	er efficiency of the
	A) 10%	B) 31.47%	C)	3.18%	D)	9.71%
15)	<ul><li>Which of the following</li><li>A) Index guided LASI</li><li>C) Double hetero junc</li></ul>	ΞR	B)	injection LASER ? Gain guided LAS Distributed feedba	ER	LASER
16)	At 1.3 $\mu$ m wavelength dependence than the s	surface emitter.				•
<b>4</b> 7\	A) Less	B) Moderate	•	Greater	•	No
17)	A photodiode has a quincident upon it, then to A) 0.694		pho			y 1.8 × 10 <sup>-13</sup> J are 0.623
18)	The carrier velocities of	,	cm/s	s of a depletion lav	,	
-,	The transit time is	,		,		
	A) 0.1 ns	B) 0.3 ns	C)	0.13 ns	D)	0.2 ns
19)	The optical power gen	erated internally by L	ED	is		
	A) $P_{int} = \eta_{int} \left( \stackrel{ci}{e}_{\lambda} \right)$	B) $P_{int} = \eta_{int} (\dot{p}_e) hf$	C)	$P_{int} = \eta_{int} \left( \frac{nci}{e} \right) hf$	D)	$P_{int} = \eta_{int} \left( \frac{i}{e} \right)$
20)	The common method to A) Multimode optical for C) Single graded inde	iber	B)	n measurement is Single step index All plastic fiber	opti	cal fiber



Seat	
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### T.E. (E & TC) (Part – II) Examination, 2016 OPTICAL COMMUNICATION

Day and Date: Thursday, 24-11-2016

Time: 10.00 a.m. to 1.00 p.m.

**Instructions**: • All questions are compulsory.

• Assume suitable data if required.

• Figures to right indicates full marks..

#### SECTION - I

2. A) Solve any three of the following:

 $(3 \times 4 = 12)$ 

Marks: 80

- 1) Explain the general block diagram of an optical communication system.
- 2) Explain phase velocity and group velocity.
- 3) Explain Rayleigh scattering loss in optical fiber.
- 4) Explain different types of fiber alignment losses.
- B) A ruby laser contains a crystal of length 4 cm with a refractive index of 1.78. The peak emission wavelength from the device is  $0.55\,\mu$  m. Determine the number of longitudinal modes and their frequency separation.
- 3. A) Solve **any two** of the following:

 $(2 \times 6 = 12)$ 

8

- 1) Explain double crucible method of fiber drawing. What are its advantages and drawbacks?
- 2) Explain any two methods of mechanical splicing techniques used for splicing single optical fibers.
- Explain injection laser characteristics.
- B) Silica has an estimated fictive temperature of  $1400^{\circ}$ K with an isothermal compressibility of  $7\times10^{-11}$  m²/N. The refractive index and the photoelastic coefficient for silica are 1.46 and 0.286 respectively. Determine the theoretical attenuation in dB/Km due to fundamental Rayleigh scattering in silica at optical wavelength of  $1\,\mu$  m. Boltzmann's constant is  $1.381\times10^{-21}$  J/°K.



#### SECTION - II

4. a) Attempt any three questions:

 $(3 \times 4 = 12)$ 

- 1) Explain the different advantages and disadvantages of LED as compare to laser.
- 2) Explain the various parameters effecting the speed of response of detectors.
- 3) Explain the total fiber attenuation measurement.
- 4) The carrier velocity in a silicon p-i-n diode with  $25 \,\mu$  m depletion layer width is  $3 \times 10^4$  m/s. Determine the maximum response time for the device.
- b) Compare the electrical and optical bandwidths for an optical fiber communication system and develop a relationship between them.
- 5. a) Attempt any two questions:

 $(2 \times 6 = 12)$ 

8

- 1) Explain the principle of optical detector.
- 2) Explain the structure of surface emitting LED.
- 3) Explain in detail the transmitter design and its requirements.
- b) The radiative and non-radiative recombination life times of minority carriers in the active region of a double heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination life time and the power internally generated within the device when the peak emission wavelength is 0.9 µm at a device current of 40 mA.


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#### T.E. (E & TC) (Part – II) Examination, 2016 **OPTICAL COMMUNICATION**

Day and Date: Thursday	, 24-11-2016	Max. Marks: 100

Time: 10.00 a.m. to 1.00 p.m.

Instructions :	• All questions are	compulsory
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- All questions are compulsory.
  Assume suitable data if required.
- Figures to right indicates full marks..
- Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer

		• Ar	nswer MC	CQ/Objectiv	e ty	estion carries <b>one</b> /pe questions on et (P/Q/R/S) on To	Pag	je No. 3 only. E	Oon't
			MCQ/C	bjective Ty	уре	Questions			
Dura	ation	: 30 Minutes						Maı	rks : 20
1.	Cho	ose the correct answe	r:					(20	×1=20)
	1)	At 1.3 $\mu$ m wavelength dependence than the sA) Less		nitter.		evice exhibits	D)		re
	2)	A photodiode has a quincident upon it, then the A) 0.694		sivity of the	pho			y 1.8 × 10 <sup>−19</sup> J a 0.623	re
	3)	The carrier velocities of The transit time is A) 0.1 ns	of approxii B) 0.3 n	•		of a depletion lay		ridth of 10 $\mu$ m. 0.2 ns	
	4)	The optical power gen	erated int	ernally by L	ED	is			
		A) $P_{int} = \eta_{int} \begin{pmatrix} ci/e\lambda \end{pmatrix}$	B) P <sub>int</sub> =	$=\eta_{int}\left(\frac{i}{e}\right)hf$	C)	$P_{int} = \eta_{int} (nc_e^{i/}) hf$	D)	$P_{int} = \eta_{int} \left( \stackrel{i}{/_{e}} \right)$	
	5)	The common method f A) Multimode optical f C) Single graded inde	iber	•	B)	n measurement is Single step index All plastic fiber	opti	cal fiber	
	6)	Which method is employed. A) Transmitted light in C) Refracted light inte	terferome	eter	B)	neasurement ? Reflected light into Both A) and B)	erfer	ometer	
	7)	The LED can operate a A) Higher current den C) Higher power		than th	B)	jection laser. Lower current der None of these	nsity		
	8)	The requirement of de A) High fidelity C) More numerical ap			•	Larger size All the above			
	9)	The detail knowledge (A) Impulse response (C) Both A) and B)		active index	B)	file enables the Transient respons None of above	se		



10)	A) The transit time of the carrier across the B) Diffusion time of carriers C) Both A) and B) D) None of above	
11)	The angles of incidence $\varphi_1$ and refraction $\varphi$ indices of the dielectrics $n_1$ and $n_2$ and are	<sub>2</sub> are related to each other and to the refractive given by Snell's law of refraction as
	A) $n_1 \sin \phi_1 = n_2 \sin \phi_2$	B) $n_1 \cos \phi_1 = n_2 \cos \phi_2$
	C) $n_1 \cos \phi_2 = n_2 \cos \phi_1$	D) $n_1 \sin \phi_2 = n_2 \sin \phi_1$
12)	The numerical aperture is a measure of A) The light scattering ability of the fiber C) The light collecting ability of the fiber	<ul><li>B) Dispersion of the fiber</li><li>D) Attenuation of the fiber</li></ul>
13)	Cutoff wavelength of an optical fiber is the v A) Above which the fiber becomes single n B) Below which the fiber becomes single n C) Above which no mode is supported D) Below which no mode is supported	noded
14)	The mean optical power launched into an 8 power at the output is $3\mu$ W. The signal atte A) 16 dB/km B) 8 dB/km	•
15)	Macrobending losses can be avoided by  A) Operating at longest wavelengths possi  B) Designing the fibers with large relative r  C) Designing the fibers with small relative r  D) None of above	efractive index differences
16)	The Vapor Axial Deposition (VAD) process A) A batch process C) Outside layer deposition process	is B) A continuous process D) Inside layer deposition process
17)	Star couplers are generally used for distribution A) Single input signal to multiple outputs  C) Multiple input signal to multiple outputs	B) Multiple input signals to single output
18)	LASER is a type of source.  A) Coherent B) Non-coherent	C) Spontaneous D) None of these
19)		cy of 18%. If the voltage applied to the device 1.43 eV, the external power efficiency of the
	A) 10% B) 31.47%	C) 3.18% D) 9.71%
20)	<ul><li>Which of the following is best single-frequent</li><li>A) Index guided LASER</li><li>C) Double hetero junction LASER</li></ul>	ncy injection LASER ? B) Gain guided LASER D) Distributed feedback LASER



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## T.E. (E & TC) (Part – II) Examination, 2016 OPTICAL COMMUNICATION

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

**Instructions**: • **All** questions are **compulsory**.

• Assume suitable data if required.

• Figures to right indicates full marks..

#### SECTION - I

2. A) Solve any three of the following:

 $(3 \times 4 = 12)$ 

- 1) Explain the general block diagram of an optical communication system.
- 2) Explain phase velocity and group velocity.
- 3) Explain Rayleigh scattering loss in optical fiber.
- 4) Explain different types of fiber alignment losses.
- B) A ruby laser contains a crystal of length 4 cm with a refractive index of 1.78. The peak emission wavelength from the device is  $0.55\,\mu$  m. Determine the number of longitudinal modes and their frequency separation.
- 3. A) Solve **any two** of the following:

 $(2 \times 6 = 12)$ 

8

- 1) Explain double crucible method of fiber drawing. What are its advantages and drawbacks?
- 2) Explain any two methods of mechanical splicing techniques used for splicing single optical fibers.
- 3) Explain injection laser characteristics.
- B) Silica has an estimated fictive temperature of  $1400^{\circ}$ K with an isothermal compressibility of  $7\times10^{-11}$  m²/N. The refractive index and the photoelastic coefficient for silica are 1.46 and 0.286 respectively. Determine the theoretical attenuation in dB/Km due to fundamental Rayleigh scattering in silica at optical wavelength of  $1\,\mu$  m. Boltzmann's constant is  $1.381\times10^{-21}$  J/°K.



#### SECTION - II

4. a) Attempt any three questions:

 $(3 \times 4 = 12)$ 

- 1) Explain the different advantages and disadvantages of LED as compare to laser.
- 2) Explain the various parameters effecting the speed of response of detectors.
- 3) Explain the total fiber attenuation measurement.
- 4) The carrier velocity in a silicon p-i-n diode with  $25 \,\mu$  m depletion layer width is  $3 \times 10^4$  m/s. Determine the maximum response time for the device.
- b) Compare the electrical and optical bandwidths for an optical fiber communication system and develop a relationship between them.
- 5. a) Attempt any two questions:

 $(2 \times 6 = 12)$ 

8

- 1) Explain the principle of optical detector.
- 2) Explain the structure of surface emitting LED.
- 3) Explain in detail the transmitter design and its requirements.
- b) The radiative and non-radiative recombination life times of minority carriers in the active region of a double heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination life time and the power internally generated within the device when the peak emission wavelength is 0.9 µm at a device current of 40 mA.

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			•	& TC) (Part OPTICAL CO	-	camination, 20 NICATION	)16		
-		Date : Thursday, 0.00 a.m. to 1.00 p		)16				Max	. Marks : 100
	I	nstructions :	<ul><li>Assur</li><li>Figure</li><li>Q. No Book</li><li>Answ</li></ul>	Page No. <b>3</b> . <b>E</b> e <b>r MCQ/Obje</b>	ata if red licates f sory. It s ach qu ective t	quired.	ne ma on Pa	rk. <b>ge No. 3 o</b>	
			N	ICQ/Objectiv	е Туре	Questions			
		: 30 Minutes							Marks : 20
		ose the correct a							(20×1=20)
-	1)	The Vapor Axial A) A batch proc C) Outside laye	ess		B)	A continuous p			
2	2)	Star couplers are A) Single input s C) Multiple input	signal to n	nultiple output	s B)	Multiple input s	ignals	to single o	utput
(	3)	LASER is a A) Coherent		_ type of sou Non-coheren		Spontaneous	D)	None of t	hese
2	4)	A GaAs injection is 2.5 V and the bedevice is	oandgap e	energy of GaA	\s is 1.4	3 eV, the extern	al pow	er efficiend	
	-\	A) 10%	,	31.47%	,	3.18%	,	9.71%	
,	o)	Which of the followard A) Index guided C) Double heter	LASER	_	В)	Gain guided L	ASER	LASER	
6	3)	At 1.3 μm wavel dependence that A) Less	n the surfa	•		levice exhibits _ Greater		temp	perature
7	7)	A photodiode has incident upon it, A) 0.694	then the r	-	the pho	-		0.623	<sup>-19</sup> J are
8	3)	The carrier veloc	ities of ap	proximately 1	10 <sup>7</sup> cm/s	s of a depletion	layer v	vidth of 10	μm.
		The transit time iA) 0.1 ns	S	0.3 ns		0.13 ns		0.2 ns	•
Ç	9)	The optical power	er generat	ted internally b	y LED	is			



10)	The common method for time domain dispe A) Multimode optical fiber C) Single graded index optical fiber	rsion measurement is  B) Single step index optical fiber  D) All plastic fiber
11)	Which method is employed for interferometric A) Transmitted light interferometer C) Refracted light interferometer	ric measurement ? B) Reflected light interferometer D) Both A) and B)
12)	The LED can operate atthan the A) Higher current density  C) Higher power	ne injection laser. B) Lower current density D) None of these
13)	The requirement of detector is  A) High fidelity  C) More numerical aperture	B) Larger size D) All the above
14)	The detail knowledge of the refractive index A) Impulse response of fiber C) Both A) and B)	profile enables the B) Transient response D) None of above
15)	The response of Avalanche photodiode is I A) The transit time of the carrier across the B) Diffusion time of carriers C) Both A) and B) D) None of above	-
16)	The angles of incidence $\phi_1$ and refraction $\phi$ indices of the dielectrics $n_1$ and $n_2$ and are	<sub>2</sub> are related to each other and to the refractive given by Snell's law of refraction as
	A) $n_1 \sin \phi_1 = n_2 \sin \phi_2$	B) $n_1 \cos \phi_1 = n_2 \cos \phi_2$
	C) $n_1 \cos \phi_2 = n_2 \cos \phi_1$	D) $n_1 \sin \phi_2 = n_2 \sin \phi_1$
17)	The numerical aperture is a measure of A) The light scattering ability of the fiber C) The light collecting ability of the fiber	<ul><li>B) Dispersion of the fiber</li><li>D) Attenuation of the fiber</li></ul>
18)	Cutoff wavelength of an optical fiber is the water A) Above which the fiber becomes single material B) Below which the fiber becomes single material C) Above which no mode is supported D) Below which no mode is supported	noded
19)	The mean optical power launched into an 8 power at the output is $3\mu$ W. The signal atte A) 16 dB/km B) 8 dB/km	•
20)	Macrobending losses can be avoided by  A) Operating at longest wavelengths possi  B) Designing the fibers with large relative r  C) Designing the fibers with small relative r  D) None of above	efractive index differences



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### T.E. (E & TC) (Part – II) Examination, 2016 OPTICAL COMMUNICATION

Day and Date: Thursday, 24-11-2016

Time: 10.00 a.m. to 1.00 p.m.

**Instructions**: • All questions are compulsory.

• Assume suitable data if required.

• Figures to right indicates full marks..

#### SECTION - I

2. A) Solve any three of the following:

 $(3 \times 4 = 12)$ 

Marks: 80

- 1) Explain the general block diagram of an optical communication system.
- 2) Explain phase velocity and group velocity.
- 3) Explain Rayleigh scattering loss in optical fiber.
- 4) Explain different types of fiber alignment losses.
- B) A ruby laser contains a crystal of length 4 cm with a refractive index of 1.78. The peak emission wavelength from the device is  $0.55\,\mu$  m. Determine the number of longitudinal modes and their frequency separation.

3. A) Solve **any two** of the following:

 $(2 \times 6 = 12)$ 

8

- 1) Explain double crucible method of fiber drawing. What are its advantages and drawbacks?
- 2) Explain any two methods of mechanical splicing techniques used for splicing single optical fibers.
- Explain injection laser characteristics.
- B) Silica has an estimated fictive temperature of  $1400^{\circ}$ K with an isothermal compressibility of  $7\times10^{-11}$  m²/N. The refractive index and the photoelastic coefficient for silica are 1.46 and 0.286 respectively. Determine the theoretical attenuation in dB/Km due to fundamental Rayleigh scattering in silica at optical wavelength of  $1\,\mu$  m. Boltzmann's constant is  $1.381\times10^{-21}$  J/°K.



#### SECTION - II

4. a) Attempt any three questions:

 $(3 \times 4 = 12)$ 

- 1) Explain the different advantages and disadvantages of LED as compare to laser.
- 2) Explain the various parameters effecting the speed of response of detectors.
- 3) Explain the total fiber attenuation measurement.
- 4) The carrier velocity in a silicon p-i-n diode with  $25 \,\mu$  m depletion layer width is  $3 \times 10^4$  m/s. Determine the maximum response time for the device.
- b) Compare the electrical and optical bandwidths for an optical fiber communication system and develop a relationship between them.
- 5. a) Attempt any two questions:

 $(2 \times 6 = 12)$ 

8

- 1) Explain the principle of optical detector.
- 2) Explain the structure of surface emitting LED.
- 3) Explain in detail the transmitter design and its requirements.
- b) The radiative and non-radiative recombination life times of minority carriers in the active region of a double heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination life time and the power internally generated within the device when the peak emission wavelength is 0.9 µm at a device current of 40 mA.

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T.E. (	Electronics and		cation) (Part – II) IMUNICATION	Examination, 2016
•	d Date : Friday, 25- <sup>-</sup> 10.00 a.m. to 1.00 <sub>l</sub>			Max. Marks: 100
,	ir 2) <b>A</b>	n Answer Book Pa A <b>nswer MCQ/Obj</b> o	nge No. <b>3. Each</b> ques ective type questior	ved in <b>first 30 minutes</b> stion carries <b>one</b> mark. <b>ns on Page No. 3 only.</b> VR/S) <b>on Top of Page.</b>
Duratio	n : 30 Minutes	MCQ/Objective	Type Questions	Marks : 20
Durano	iii. 00 iviiiidic3			Warks . 20
1. Ch	oose the correct an	swer:		(20×1=20)
1)	Which of the follow BS?	_	ed for voice transmis	ssion from the MS to
	a) RVC	b) FVC	c) FCC	d) RCC
2)	The technique acco-channel interfer	•	ase the system ca	pacity and reduce
	a) Sectorization	b) Trunking	c) GOS	d) None of these
3)	The design proces station within syste	_	allocating channel g	roup for all the base
	a) Frequency reus		b) Handoff	
	c) Umbrella cell ap	•	d) None of these	
4)	<ul><li>To reduce co-chan</li><li>a) Decrease the se</li><li>b) Increase the se</li><li>c) Increase the an</li><li>d) None of these</li></ul>	eparation betwee paration betweer		
5)	•		curs in the medium on the correct angle	•

6) The model which reasonably accurate for predicting large scale signal strength over several kilometer is

c) Two ray model d) None of above

7) RMS delay spread is related to

a) Reflection

- a) Time dispersion parameter b) Coherence bandwidth
- c) Coherence time d) Doppler spread

b) Diffraction



8)	In TDMA/FDD the for in TDMA/TDD		e channel frequenci	es while
	a) differ, same	b) same, differ	c) same, same	d) differ, differ
9)	times greater than r	minimum required	RF bandwidth.	width that is several
	a) TDMA		c) FDMA	
10)	and less interference	ce is		tional antenna gain
	a) SDMA	b) TDMA	c) SSMA	d) Both a and b
11)	Which of the follow a) Soft Hand-off	_		d) None of these
12)	GSM stands for a) Global Service f c) Group of Specia			
13)	The is t the identity of mobil	he database at MS	SC that keeps the in	
	a) HLR	b) VLR	c) AuC	d) EIR
14)	In mobile station ar a) uplink			
15)	<ul><li>Which of the follow</li><li>a) Control BTS</li><li>b) To accept a call</li><li>c) To provide serv</li><li>d) All of the above</li></ul>	or a hand-off		
16)	Types of handover a) Soft handover c) Both a and b	is	<ul><li>b) Hard handover</li><li>d) None</li></ul>	
17)	Modulation techniq a) Uplink-QPSK do c) Uplink-BPSK do	wnlink-BPSK	b) Uplink-BPSK d	ownlink-BPSK
18)	Standard GSM sys a) 9.6 kbps	• •	ta rate of c) 128 kbps	d) 120 kbps
19)	In paging framing ca) 8 half frames			
20)	The logical channel a) Transport			



Seat	
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# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MOBILE COMMUNICATION

Day and Date: Friday, 25-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

#### SECTION-I

2. Solve any four: (4×4=16)

- a) Explain the process of Handoff in cellular system.
- b) Describe SDMA technique for cellular system.
- c) Describe Fresnel zone geometry.
- d) How to improve coverage and capacity of a cellular system?
- e) What is Rayleigh fading distribution?

## 3. Solve any three: (8×3=24)

- a) Explain practical link budget design using path loss model in detail.
- b) Consider service area of a cellular system is 6300 km<sup>2</sup>, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km<sup>2</sup>.
  - 1) Calculate replication factor for the cluster of size 7. Calculate number of channels per cell and system capacity.
  - 2) Calculate above parameter if the cluster size is decreased from 7 to 4 and comment on result obtained.
- c) Describe TDMA technique in detail and compare it with FDMA.
- d) Explain the following techniques.
  - 1) Flat fading
  - 2) Frequency selective fading
  - 3) Slow fading
  - 4) Fast fading.



#### SECTION - II

4. Attempt any four of the following:

 $(4 \times 4 = 16)$ 

- a) What is Handoff? Explain Handoff in GSM.
- b) Explain with neat block diagram forward channels in W-CDMA.
- c) Explain the various services and features provided by GSM.
- d) Write a short note on GPRS.
- e) Explain multiple access, duplexing techniques and modulation in GSM.
- 5. Attempt any three of the following:

 $(8 \times 3 = 24)$ 

- a) Give the detail comparasion for IS-95, IMT-2000 and WCDMA std's.
- b) What are the different identifiers used in GSM, explain in detail.
- c) Explain in detail forward IS 95-CDMA link structure.
- d) Draw and explain GSM network architecture in detail.

# **SLR-EP - 145**

	_		i								
Seat No.										Set	Q
T.E.	(	Electronics					on) (Part – I NICATION	II) Ex	aminat	ion, 2	2016
-		d Date : Friday			5				Max.	Marks	: 100
ııme	:	10.00 a.m. to 1	1.00 p	.m.							
	1	nstructions:	in . 2) <b>A</b> I	Answe <b>nswer</b> l	r Book Pag <b>MCQ/Objec</b>	e N ctiv	. It should be s lo. 3. Each quo e type question, Q.P. Set (P.	estion <b>ons o</b> l	carries <b>o</b> n <b>Page N</b>	one m lo. 3 o	ark. <b>nly.</b>
Durat	i۵	n : 30 Minutes		MCQ/C	Objective T	уре	Questions			Mork	s : 20
Durai	Ю	n . 30 Minutes								IVIAIK	.S . ZU
1. C	h	oose the corre	ct ans	wer:						(20×	1=20)
1	l)	Types of hand a) Soft hando c) Both a and	ver	is		-	Hard handov None	er			
2	2)	Modulation tea a) Uplink-QPS c) Uplink-BPS	SK do	wnlink-	BPSK	b)	00 is Uplink-BPSK None	dowr	nlink-BPS	SK	
3	3)	Standard GSI a) 9.6 kbps	M syst	ems sı b) 64			ate of 128 kbps	d)	120 kbp	os	
2	1)	In paging fram a) 8 half fram	_				el slot consist 10 half frame		18 half	frame	S
5	5)	The logical ch a) Transport	annel	s are ca b) Pilo		c)	channels Reverse pilo				
6	3)	Which of the forms	ollowi							e MS t	:О
		a) RVC		b) FV		,	FCC	,	RCC		
7	7)	The technique co-channel intal a) Sectorizati	terfere	=			he system o	-	ity and None of		
8	3)	The design prostation within	syste	m is ca	_		_	grou	o for all th	ne bas	e
		a) Frequency				•	Handoff				
		c) Umbrella c	ell ap	oroach		d)	None of thes	е			



9)	To reduce co-change a) Decrease the set b) Increase the set c) Increase the ant d) None of these	eparation between paration between t				
10)	The angle at which a) Brewster angle					•
11)	The model which re over several kilome a) Reflection	eter is	•			
12)	RMS delay spread a) Time dispersion c) Coherence time	is related to parameter	b)	•	dwi	
13)	In TDMA/FDD the form TDMA/TDD	<del></del>		·		
	a) differ, same	•	,	•	•	
14)		=			wid	th that is several
	times greater than a) TDMA	b) SDMA			d)	SSMA
15)	Receives a stronge and less interferen	ce is				_
	a) SDMA	,	•		d)	Both a and b
16)	Which of the follow a) Soft Hand-off	_			d)	None of these
17)	GSM stands for a) Global Service t c) Group of Specia		•	•		
18)	The is the identity of mobil	le phone equipmer	nt.	·		
	a) HLR	b) VLR	,	AuC	,	EIR
19)	In mobile station ar a) uplink	nd base station down b) forward link				as none
20)	Which of the follow a) Control BTS b) To accept a call c) To provide serv d) All of the above	or a hand-off ices to all mobile s				



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MOBILE COMMUNICATION

Day and Date: Friday, 25-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

### SECTION-I

2. Solve any four: (4×4=16)

- a) Explain the process of Handoff in cellular system.
- b) Describe SDMA technique for cellular system.
- c) Describe Fresnel zone geometry.
- d) How to improve coverage and capacity of a cellular system?
- e) What is Rayleigh fading distribution?

### 3. Solve any three:

- a) Explain practical link budget design using path loss model in detail.
- b) Consider service area of a cellular system is 6300 km<sup>2</sup>, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km<sup>2</sup>.
  - 1) Calculate replication factor for the cluster of size 7. Calculate number of channels per cell and system capacity.
  - 2) Calculate above parameter if the cluster size is decreased from 7 to 4 and comment on result obtained.
- c) Describe TDMA technique in detail and compare it with FDMA.
- d) Explain the following techniques.
  - 1) Flat fading
  - 2) Frequency selective fading
  - 3) Slow fading
  - 4) Fast fading.

 $(8 \times 3 = 24)$ 



### SECTION - II

4. Attempt any four of the following:

 $(4 \times 4 = 16)$ 

- a) What is Handoff? Explain Handoff in GSM.
- b) Explain with neat block diagram forward channels in W-CDMA.
- c) Explain the various services and features provided by GSM.
- d) Write a short note on GPRS.
- e) Explain multiple access, duplexing techniques and modulation in GSM.
- 5. Attempt any three of the following:

 $(8 \times 3 = 24)$ 

- a) Give the detail comparasion for IS-95, IMT-2000 and WCDMA std's.
- b) What are the different identifiers used in GSM, explain in detail.
- c) Explain in detail forward IS 95-CDMA link structure.
- d) Draw and explain GSM network architecture in detail.

a) 9.6 kbps

						3	LK-E	P – 1	45
Seat No.								Set	R
T.E.	(Electronics		Telecommunio			) Ex	aminati	on, 20	)16
-	nd Date : Friday 10.00 a.m. to						Max. N	Marks :	100
	Instructions :	in / 2) <b>An</b>	No. 1 is compuls Answer Book Pa Iswer MCQ/Obje In't forget to me	ge \ ectiv	lo. <b>3. Each</b> que: <b>e type questio</b> l	stion <b>ns o</b> i	carries <b>c</b> n <b>Page N</b>	<b>ne</b> mai <b>o. 3 on</b> i	rk. <b>ly.</b>
		ľ	MCQ/Objective	Туре	Questions				
Durati	on : 30 Minutes							Marks	: 20
1. C	hoose the corre	ct ans	wer:					(20×1:	=20)
1	•		ng is based on C b) Hard hand-of			d)	None of	these	
2	•	rvice fo	or Mobile Machines	•	Global Systen Global Scope				
3	the identity of	mobile	ne database at M e phone equipme	ent.	·			out	
4	<ul><li>a) HLR</li><li>) In mobile stat</li><li>a) uplink</li></ul>	ion an	b) VLR d base station do b) forward link	ownl		red a	EIR as none		
5	<ul><li>a) Control BT</li><li>b) To accept</li></ul>	S a call o service	ng are functions or a hand-off ces to all mobile						
6	) Types of hand a) Soft hando c) Both a and	ver	s	,	Hard handove None	r			
7	) Modulation te a) Uplink-QP c) Uplink-BP	SK dov		b)	000 is Uplink-BPSK o None	dowr	nlink-BPS	K	
8	) Standard GS	M syst	ems support a d	ata r	ate of				

b) 64 kbps c) 128 kbps d) 120 kbps



9)	In paging framing c a) 8 half frames					18 half frames
10)	The logical channel	•	-		-	
10)				Reverse pilot		
11)	Which of the followings?	•	•	•	•	
	a) RVC	b) FVC	c)	FCC	d)	RCC
12)	The technique ac co-channel interfere	ence.				
	a) Sectorization	,	•		•	None of these
13)	The design process station within syste	em is called as			rou	o for all the base
	<ul><li>a) Frequency reuse</li><li>c) Umbrella cell ap</li></ul>		,	Handoff None of these		
14)	To reduce co-chang a) Decrease the set b) Increase the set c) Increase the ant d) None of these	eparation between paration between t				
15)	The angle at which a) Brewster angle					_
16)	The model which reover several kilome	eter is				
	a) Reflection	b) Diffraction	c)	Two ray model	d)	None of above
17)	RMS delay spread a) Time dispersion c) Coherence time	parameter	,	Coherence ban Doppler spread		dth
18)	In TDMA/FDD the form TDMA/TDD		ch	annel frequencie	es_	while
	a) differ, same	b) same, differ	c)	same, same	d)	differ, differ
19)	uses significant times greater than r	gnals which have a minimum required			wid	th that is several
	a) TDMA	b) SDMA			d)	SSMA
20)	Receives a stronge and less interference		ceiv	ver due to direct	ion	al antenna gain
	a) SDMA		c)	SSMA	d)	Both a and b



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MOBILE COMMUNICATION

Day and Date: Friday, 25-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

### SECTION-I

2. Solve any four: (4×4=16)

- a) Explain the process of Handoff in cellular system.
- b) Describe SDMA technique for cellular system.
- c) Describe Fresnel zone geometry.
- d) How to improve coverage and capacity of a cellular system?
- e) What is Rayleigh fading distribution?

### 3. Solve any three: (8×3=24)

- a) Explain practical link budget design using path loss model in detail.
- b) Consider service area of a cellular system is 6300 km<sup>2</sup>, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km<sup>2</sup>.
  - 1) Calculate replication factor for the cluster of size 7. Calculate number of channels per cell and system capacity.
  - 2) Calculate above parameter if the cluster size is decreased from 7 to 4 and comment on result obtained.
- c) Describe TDMA technique in detail and compare it with FDMA.
- d) Explain the following techniques.
  - 1) Flat fading
  - 2) Frequency selective fading
  - 3) Slow fading
  - 4) Fast fading.

Set R



#### SECTION - II

4. Attempt any four of the following:

 $(4 \times 4 = 16)$ 

- a) What is Handoff? Explain Handoff in GSM.
- b) Explain with neat block diagram forward channels in W-CDMA.
- c) Explain the various services and features provided by GSM.
- d) Write a short note on GPRS.
- e) Explain multiple access, duplexing techniques and modulation in GSM.
- 5. Attempt any three of the following:

 $(8 \times 3 = 24)$ 

- a) Give the detail comparasion for IS-95, IMT-2000 and WCDMA std's.
- b) What are the different identifiers used in GSM, explain in detail.
- c) Explain in detail forward IS 95-CDMA link structure.
- d) Draw and explain GSM network architecture in detail.


### **SLR-EP - 145**

							/LI (-LI	170
Seat No.							Set	S
T.E.	(Electronics		lecommunic DBILE COMI			Ex	amination,	2016
-	nd Date : Friday : 10.00 a.m. to						Max. Marks	s : 100
	Instructions:	in Ansv	swer Book Pag v <b>er MCQ/Obje</b>	ge N ctiv	It should be sol lo. 3. Each ques e type question n, Q.P. Set (P/Q	stion I <b>s o</b> l	n carries <b>one</b> m <b>n Page No. 3 c</b>	nark. <b>only.</b>
		MC	Q/Objective T	урє	Questions			
Durati	on: 30 Minutes						Mark	ks : 20
1. C	hoose the corre	ct answe	r:				(20×	(1= <b>2</b> 0)
1	<ul><li>) The model wh over several I a) Reflection</li></ul>	kilometer			oredicting large: Two ray model			
2	e) RMS delay sp a) Time dispe c) Coherence	ersion pa		•	Coherence bar Doppler spread		dth	
3	in TDMA/FDD in TDMA/TDD a) differ_sam		_		annel frequenci same, same			le
4	times greater	ses signa than min	ls which have a	a tra RF	nsmission band	lwid		al
5	<ul><li>Receives a stand less inter</li><li>a) SDMA</li></ul>	ference i	-				al antenna ga Both a and b	in
6	<ul><li>Which of the f</li><li>a) Soft Hand-</li></ul>	•			A ? Both a and b	d)	None of these	e
7		rvice for <b>N</b>			Global System Global Scope f			
8	the		database at MS hone equipme		hat keeps the ir	nforr	mation about	

c) AuC d) EIR

P.T.O.

b) VLR

a) HLR



9)	In mobile station and base station do a) uplink b) forward link	ownlink is also referred as c) reverse link d) none
10)	<ul><li>Which of the following are functions</li><li>a) Control BTS</li><li>b) To accept a call or a hand-off</li><li>c) To provide services to all mobile</li><li>d) All of the above</li></ul>	
11)	Types of handover is a) Soft handover c) Both a and b	b) Hard handover d) None
12)	Modulation techniques used in CDM a) Uplink-QPSK downlink-BPSK c) Uplink-BPSK downlink-QPSK	b) Uplink-BPSK downlink-BPSK
13)	Standard GSM systems support a da a) 9.6 kbps b) 64 kbps	
14)	In paging framing channel, paging cl a) 8 half frames b) 6 half frames	nannel slot consists of c) 10 half frames d) 18 half frames
15)	The logical channels are calleda) Transport b) Pilot	channels in W-CDMA. c) Reverse pilot d) Global
16)	Which of the following channel is use BS?	ed for voice transmission from the MS to
	a) RVC b) FVC	c) FCC d) RCC
17)	co-channel interference.	se the system capacity and reduce
40)	a) Sectorization b) Trunking	•
18)	station within system is called as  a) Frequency reuse	allocating channel group for all the base b) Handoff
	c) Umbrella cell approach	d) None of these
19)	To reduce co-channel interference a) Decrease the separation between b) Increase the separation between c) Increase the antenna height d) None of these	
20)	The angle at which no. reflection occa) Brewster angle b) Doppler angle	curs in the medium of origin? e c) Perfect angle d) None of these



Seat	
No.	

# T.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 MOBILE COMMUNICATION

Day and Date: Friday, 25-11-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

#### SECTION-I

2. Solve any four: (4×4=16)

- a) Explain the process of Handoff in cellular system.
- b) Describe SDMA technique for cellular system.
- c) Describe Fresnel zone geometry.
- d) How to improve coverage and capacity of a cellular system?
- e) What is Rayleigh fading distribution?

### 3. Solve any three: (8×3=24)

- a) Explain practical link budget design using path loss model in detail.
- b) Consider service area of a cellular system is 6300 km<sup>2</sup>, a total of 1001 radio channels are available for traffic handling and the area of one cell is 18 km<sup>2</sup>.
  - 1) Calculate replication factor for the cluster of size 7. Calculate number of channels per cell and system capacity.
  - 2) Calculate above parameter if the cluster size is decreased from 7 to 4 and comment on result obtained.
- c) Describe TDMA technique in detail and compare it with FDMA.
- d) Explain the following techniques.
  - 1) Flat fading
  - 2) Frequency selective fading
  - 3) Slow fading
  - 4) Fast fading.

#### SECTION - II

4. Attempt any four of the following:

 $(4 \times 4 = 16)$ 

- a) What is Handoff? Explain Handoff in GSM.
- b) Explain with neat block diagram forward channels in W-CDMA.
- c) Explain the various services and features provided by GSM.
- d) Write a short note on GPRS.
- e) Explain multiple access, duplexing techniques and modulation in GSM.
- 5. Attempt any three of the following:

 $(8 \times 3 = 24)$ 

- a) Give the detail comparasion for IS-95, IMT-2000 and WCDMA std's.
- b) What are the different identifiers used in GSM, explain in detail.
- c) Explain in detail forward IS 95-CDMA link structure.
- d) Draw and explain GSM network architecture in detail.

# SLR-EP-146(a)

Seat No.	Set	Р
		_

# T.E. (Part – II) (Electronics & Telecommunication) Examination, 2016 Self Learning COMPUTER ORGANIZATION

Day and Date: Saturday, 26-11-2016 Total Marks: 50

Time: 10.00 a.m. to 12.00 noon

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

### MCQ/Objective Type Questions

Marks: 10

### SECTION-I

Ch	oose the correct ar	nswer:			(10×1=10)
1)	A group of four bit	s is known as			
	a) nibble	b) byte	c)	bit	d) all of above
2)	is u	sed to store the	e data ar	nd progr	am.
	a) Memory unit		b)	Input u	nit
	c) Output unit		d)	None o	f the above
3)	ROM stands for				
	a) Read Only Mei	mory	b)	Rando	m Only Memory
	c) Read Online M	emory	d)	None o	f the above
4)	In re	presentation,	numbe	rs are	represented by mantissa
	comprising the sig	nificant digits	and an e	xponen	t part of radix.
	a) Floating point		b)	Fixed p	oint
	c) Decimal number	er	d)	None o	f the above
5)	LRU stands for				
	a) Least Recently	Used	b)	Last Re	ecently Used
	c) Last Randomly	Used	d)	None o	f the above
	<ul><li>1)</li><li>2)</li><li>3)</li><li>4)</li></ul>	<ol> <li>A group of four bit a) nibble</li> <li> is u         a) Memory unit         c) Output unit</li> <li>ROM stands for         a) Read Only Mer         c) Read Online M</li> <li>In re         comprising the sig         a) Floating point         c) Decimal number</li> <li>LRU stands for         a) Least Recently</li> </ol>	<ul> <li>2) is used to store the a) Memory unit</li> <li>c) Output unit</li> <li>3) ROM stands for <ul> <li>a) Read Only Memory</li> <li>c) Read Online Memory</li> </ul> </li> <li>4) In representation, comprising the significant digits <ul> <li>a) Floating point</li> <li>c) Decimal number</li> </ul> </li> </ul>	1) A group of four bits is known as a) nibble b) byte c)  2) is used to store the data ar a) Memory unit b) c) Output unit d)  3) ROM stands for a) Read Only Memory b) c) Read Online Memory d)  4) In representation, number comprising the significant digits and an erap a) Floating point b) c) Decimal number d)  5) LRU stands for a) Least Recently Used b)	1) A group of four bits is known as a) nibble b) byte c) bit  2) is used to store the data and progration and progration is used to store the data and progration and progration is used to store the data and progration and progration is used to store the data and progration and progration is used to store the data and progration and progration is used to store the data and progration and progration is used to store the data and progration and progration is used to store the data and progration is used to store the dat



# SECTION-II

6)	ar	e the different type	s o	f generating cont	trol signals.
	a) Microprogramme	ed	b)	Hardwired	
	c) Microinstruction		d)	Both a and b	
7)	Hardwired control g	generator consists	of		
	a) Decoder/Encode	er	b)	Condition codes	3
	c) Control/step cou	ınter	d)	All of the above	
8)	In microprogramme	ed approach, signa	ls a	re generated by	
	a) machine instruc	tions	b)	system progran	ns
	c) utility tools		d)	none of the abo	ve
9)	After the compilation	on of DMA transfer	pro	ocessor is notifie	ed by
	a) Acknowledge sig	gnal	b)	Interrupt signal	
	c) WMFC signal		d)	None of the abo	ve
10)	DMA controller has	registers	3.		
	a) 1	b) 2	c)	3	d) 4

Seat	
No.	

# T.E. (Part – II) (Electronics & Telecommunication) Examination, 2016 Self Learning COMPUTER ORGANIZATION

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 12.00 noon

SECTION-I

2. Solve any two: (20 Marks)

- a) Explain the fundamental units of CPU.
- b) Explain various memory allocations schemes.
- c) Write a note on:
  - i) CISC
  - ii) Cache memory.

SECTION - II

3. Solve any two:

(20 Marks)

- a) Explain microprogrammed control design with the help of neat diagram.
- b) Explain DMA architecture with the help of neat diagram.
- c) Explain processor programmed I/O architecture.

	SLR-EP – 146(a)
Seat No.	Set Q
Sel	Telecommunication) Examination, 2016 If Learning R ORGANIZATION
Day and Date : Saturday, 26-11-2016 Time : 10.00 a.m. to 12.00 noon	Total Marks : 50
Page No. <b>3</b> . <b>E</b> 2) <b>Answer MCQ</b>	mpulsory. It should be solved in Answer Book ach question carries one mark.  Objective type questions on Page No. 3 only. o mention, Q.P. Set (P/Q/R/S) on Top of Page.
MCQ/Objec	etive Type Questions Marks : 10
SI	ECTION-I
1. Choose the correct answer:	(10×1=10)
<ol> <li>LRU stands for</li> <li>a) Least Recently Used</li> <li>c) Last Randomly Used</li> </ol>	<ul><li>b) Last Recently Used</li><li>d) None of the above</li></ul>
<ul><li>2) In representation comprising the significant digits</li><li>a) Floating point</li><li>c) Decimal number</li></ul>	n, numbers are represented by mantissa s and an exponent part of radix. b) Fixed point d) None of the above
<ul><li>3) ROM stands for</li><li>a) Read Only Memory</li><li>c) Read Online Memory</li></ul>	<ul><li>b) Random Only Memory</li><li>d) None of the above</li></ul>
a) Memory unit	ne data and program. b) Input unit
c) Output unit	d) None of the above

c) bit

5) A group of four bits is known as

b) byte

a) nibble

d) all of above



		SECTIO	N – II	
6)	DMA controller has	registers	S.	
	a) 1	b) 2	c) 3	d) 4
7)	After the compilatio a) Acknowledge sig c) WMFC signal		processor is notified b) Interrupt signal d) None of the abo	·
8)	In microprogramme <ul><li>a) machine instruct</li><li>c) utility tools</li></ul>		als are generated by b) system prograr d) none of the abo	ns
9)	Hardwired control g a) Decoder/Encode c) Control/step cou	r	of b) Condition codes d) All of the above	
10)	a) Microprogramme c) Microinstruction		es of generating con b) Hardwired d) Both a and b	trol signals

Seat	
No.	

# T.E. (Part – II) (Electronics & Telecommunication) Examination, 2016 Self Learning COMPUTER ORGANIZATION

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 12.00 noon

SECTION-I

2. Solve any two: (20 Marks)

- a) Explain the fundamental units of CPU.
- b) Explain various memory allocations schemes.
- c) Write a note on:
  - i) CISC
  - ii) Cache memory.

SECTION - II

3. Solve **any two**:

(20 Marks)

- a) Explain microprogrammed control design with the help of neat diagram.
- b) Explain DMA architecture with the help of neat diagram.
- c) Explain processor programmed I/O architecture.

|--|--|

# SLR-EP-146(a)

Seat No.		Set R
T.E. (Part – II) (	Electronics & Telecommunicatio Self Learning COMPUTER ORGANIZATION	,
Day and Date: Sature Time: 10.00 a.m. to	•	Total Marks : 50
Instructions :	<ol> <li>Q. No. 1 is compulsory. It should be Page No. 3. Each question carries</li> <li>Answer MCQ/Objective type quest Don't forget to mention, Q.P. Set (Insert Section 2)</li> </ol>	one mark. tions on Page No. 3 only.
	MCQ/Objective Type Questions	Marks : 10
	SECTION-I	
1. Choose the corre	ect answer:	(10×1=10)
,	representation, numbers are represeignificant digits and an exponent parts.	•

2) ROM stands for

a) Floating point

c) Decimal number

- c) Read Online Memory
- a) Read Only Memory b) Random Only Memory d) None of the above
- 3) LRU stands for
  - a) Least Recently Used
  - c) Last Randomly Used
- 4) A group of four bits is known as
  - a) nibble
- b) byte
- c) bit
- d) all of above
- 5) \_\_\_\_\_ is used to store the data and program.
  - a) Memory unit

b) Input unit

b) Fixed point

d) None of the above

b) Last Recently Used

d) None of the above

c) Output unit

d) None of the above



# SECTION-II

6)	After the compilation of DMA transferal Acknowledge signal c) WMFC signal	r processor is notifice b) Interrupt signal d) None of the abo	•
7)	In microprogrammed approach, signa a) machine instructions	als are generated by b) system prograr	
	c) utility tools	d) none of the abo	ve
8)	DMA controller has register	S.	
	a) 1 b) 2	c) 3	d) 4
9)	are the different type	es of generating con	trol signals
	a) Microprogrammed	b) Hardwired	
	c) Microinstruction	d) Both a and b	
10)	Hardwired control generator consists	of	
	a) Decoder/Encoder	b) Condition codes	S
	c) Control/step counter	d) All of the above	<b>;</b>

Seat	
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# T.E. (Part – II) (Electronics & Telecommunication) Examination, 2016 Self Learning COMPUTER ORGANIZATION

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 12.00 noon

SECTION-I

2. Solve any two: (20 Marks)

- a) Explain the fundamental units of CPU.
- b) Explain various memory allocations schemes.
- c) Write a note on:
  - i) CISC
  - ii) Cache memory.

SECTION - II

3. Solve any two:

(20 Marks)

- a) Explain microprogrammed control design with the help of neat diagram.
- b) Explain DMA architecture with the help of neat diagram.
- c) Explain processor programmed I/O architecture.

1					<b>SLR-EP - 146</b>	(a)
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T.E	. (Part – II) (Elec		Learn	ing	ion) Examination, 201	6
•	nd Date : Saturday, 1 10.00 a.m. to 12.00				Total Marks	: 50
	2) <i>i</i>	Page No. <mark>3. Ea</mark> Answer MCQ/0	ch ques Objectiv	tion carrie <b>e type qu</b> e	d be solved in Answer Bodes one mark. estions on Page No. 3 onl. t (P/Q/R/S) on Top of Page	y.
		MCQ/Object	ive Type	e Questio	n <b>s</b> Marks	: 10
		SE	CTION -	- I		
1. Ch	noose the correct a	nswer:			(10×1=	=10)
1)	ROM stands for					
	a) Read Only Me		•		Only Memory	
	c) Read Online M	lemory	d)	None of t	he above	
2)		sed to store the				
	•			-		
0)	c) Output unit		u)	None of t	ne above	
3)	A group of four bit a) nibble	b) byte	c)	bit	d) all of above	
4)	LRU stands for					
	a) Least Recently		,		ently Used	
	<ul><li>c) Last Randomly</li></ul>	/ Used	d)	None of t	ne above	

5) In \_\_\_\_\_ representation, numbers are represented by mantissa

b) Fixed point

d) None of the above

comprising the significant digits and an exponent part of radix.

a) Floating point

c) Decimal number



# SECTION-II

6)	In microprogrammed approach, signal a) machine instructions c) utility tools	Is are generated by b) system programd) none of the abor	
7)	Hardwired control generator consists	of	
	a) Decoder/Encoder	b) Condition codes	;
	c) Control/step counter	d) All of the above	
8)	are the different type	s of generating cont	rol signals.
	a) Microprogrammed	b) Hardwired	
	c) Microinstruction	d) Both a and b	
9)	DMA controller has registers	S.	
	a) 1 b) 2	c) 3	d) 4
10)	After the compilation of DMA transfer	processor is notifie	d by
	a) Acknowledge signal	b) Interrupt signal	
	c) WMFC signal	d) None of the abo	ve

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# T.E. (Part – II) (Electronics & Telecommunication) Examination, 2016 Self Learning COMPUTER ORGANIZATION

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 12.00 noon

SECTION-I

2. Solve any two: (20 Marks)

- a) Explain the fundamental units of CPU.
- b) Explain various memory allocations schemes.
- c) Write a note on:
  - i) CISC
  - ii) Cache memory.

SECTION - II

3. Solve any two:

(20 Marks)

- a) Explain microprogrammed control design with the help of neat diagram.
- b) Explain DMA architecture with the help of neat diagram.
- c) Explain processor programmed I/O architecture.

### 

# **SLR-EP-146(b)**

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# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

### MCQ/Objective Type Questions

Marks: 10

1. Choose the correct answer:

 $(10 \times 1 = 10)$ 

- 1) What is operating system?
  - a) Collection of programs that manages hardware resources
  - b) System service provider to the application programs
  - c) Link to interface the hardware and application programs
  - d) All of the mentioned
- 2) Which one of the following is NOT true?
  - a) kernel is the program that constitutes the central core of the operating system
  - b) kernel is the first part of operating system to load into memory during booting
  - c) kernel is made of various modules which can not be loaded in running operating system
  - d) kernel remains in the memory during the entire computer session
- 3) In operating system, each process has its own
  - a) address space and global variables
  - b) open files
  - c) pending alarms, signals and signal handlers
  - d) all of the mentioned



4)	In Unix, which system call creates the	ne new process ?
	a) fork	b) create
	c) new	d) none of the mentioned
5)	Which module gives control of the C short-term scheduler?	PU to the process selected by the
		h) interrupt
	<ul><li>a) dispatcher</li><li>c) scheduler</li></ul>	<ul><li>b) interrupt</li><li>d) none of the mentioned</li></ul>
6)	•	·
6)	is termed as	on of a process to the time of completion
	a) waiting time	b) turnaround time
	c) response time	d) throughput
7)	, .	queue by the scheduler,
.,	to be executed.	quoue by the concaulon,
	a) blocked, short term	b) wait, long term
	c) ready, short term	d) ready, long term
8)	Round robin scheduling falls under the	he category of
	a) Non preemptive scheduling	
	b) Preemptive scheduling	
	c) None of these	
	d) All of the above	
9)	Which of the following condition is re	equired for deadlock to be possible?
	a) mutual exclusion	
	b) a process may hold allocated re other resources	esources while awaiting assignment of
	c) no resource can be forcibly remo	ved from a process holding it
	d) all of the mentioned	
10)	Which one of the following is the add	Iress generated by CPU ?
	a) physical address	b) absolute address
	c) logical address	d) none of the mentioned



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# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 1.00 p.m.

### 2. Solve any four:

20

- a) What is spooling? Explain simple batch system.
- b) Write note on 1. Time sharing system 2. Real time system.
- c) Explain process life cycle with neat diagram.
- d) What is process? Explain scheduling criteria.
- e) Explain necessary conditions for Deadlock.

### 3. Solve any two:

20

- a) Explain any two scheduling algorithms with example.
- b) How will you prevent deadlock? Explain.
- c) What is swapping? Explain contiguous allocation.

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### **SLR-EP-146(b)**

Seat No.
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### T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) **OPERATING SYSTEM**

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

**Instructions**: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

### MCQ/Objective Type Questions

Marks: 10

1.	Choose the	e cor	rect a	nswer	:			(10×1=10)	
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- 1) Which of the following condition is required for deadlock to be possible?
  - a) mutual exclusion

- b) a process may hold allocated resources while awaiting assignment of other resources
- c) no resource can be forcibly removed from a process holding it
- d) all of the mentioned
- 2) 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
- 3) A process is selected from the \_\_\_\_\_ queue by the \_\_\_\_ scheduler, to be executed.
  - a) blocked, short term
- b) wait, long term

c) ready, short term

- d) ready, long term
- 4) Round robin scheduling falls under the category of
  - a) Non preemptive scheduling
  - b) Preemptive scheduling
  - c) None of these
  - d) All of the above



5)	What	is	operating	system	?
----	------	----	-----------	--------	---

- a) Collection of programs that manages hardware resources
- b) System service provider to the application programs
- c) Link to interface the hardware and application programs
- d) All of the mentioned
- 6) Which one of the following is NOT true?
  - a) kernel is the program that constitutes the central core of the operating system
  - b) kernel is the first part of operating system to load into memory during booting
  - c) kernel is made of various modules which can not be loaded in running operating system
  - d) kernel remains in the memory during the entire computer session
- 7) In operating system, each process has its own
  - a) address space and global variables
  - b) open files
  - c) pending alarms, signals and signal handlers
  - d) all of the mentioned
- 8) In Unix, which system call creates the new process?
  - a) fork

b) create

c) new

- d) none of the mentioned
- 9) Which module gives control of the CPU to the process selected by the short-term scheduler?
  - a) dispatcher

b) interrupt

c) scheduler

- d) none of the mentioned
- The interval from the time of submission of a process to the time of completion is termed as
  - a) waiting time

b) turnaround time

c) response time

d) throughput



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# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 1.00 p.m.

### 2. Solve any four:

20

- a) What is spooling? Explain simple batch system.
- b) Write note on 1. Time sharing system 2. Real time system.
- c) Explain process life cycle with neat diagram.
- d) What is process? Explain scheduling criteria.
- e) Explain necessary conditions for Deadlock.

### 3. Solve any two:

20

- a) Explain any two scheduling algorithms with example.
- b) How will you prevent deadlock? Explain.
- c) What is swapping? Explain contiguous allocation.

# **SLR-EP-146(b)**

Seat No.	Set	R

# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

### MCQ/Objective Type Questions

Marks: 10

1	Choose	the	correct	anewer	
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 $(10 \times 1 = 10)$ 

- 1) Which module gives control of the CPU to the process selected by the short-term scheduler?
  - a) dispatcher

b) interrupt

c) scheduler

- d) none of the mentioned
- 2) The interval from the time of submission of a process to the time of completion is termed as
  - a) waiting time

b) turnaround time

c) response time

- d) throughput
- 3) Which of the following condition is required for deadlock to be possible?
  - a) mutual exclusion
  - b) a process may hold allocated resources while awaiting assignment of other resources
  - c) no resource can be forcibly removed from a process holding it
  - d) all of the mentioned
- 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)	In operating system, each process hat a) address space and global variable b) open files	
	<ul><li>c) pending alarms, signals and signal</li><li>d) all of the mentioned</li></ul>	handlers
6)	In Unix, which system call creates the	e new process ?
	a) fork	b) create
	c) new	d) none of the mentioned
7)	What is operating system?	
	a) Collection of programs that manag	es hardware resources
	b) System service provider to the app	olication programs
	c) Link to interface the hardware and	application programs
	d) All of the mentioned	
8)	Which one of the following is NOT tru	e ?
	<ul><li>a) kernel is the program that constit system</li></ul>	utes the central core of the operating
	b) kernel is the first part of operating booting	g system to load into memory during
	c) kernel is made of various module operating system	s which can not be loaded in running
	d) kernel remains in the memory duri	ng the entire computer session
9)	A process is selected from the to be executed.	queue by the scheduler,
	a) blocked, short term	b) wait, long term
	c) ready, short term	d) ready, long term
10)	Round robin scheduling falls under the	e category of
	a) Non preemptive scheduling	
	b) Preemptive scheduling	
	c) None of these	
	d) All of the above	



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# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 1.00 p.m.

## 2. Solve any four:

20

- a) What is spooling? Explain simple batch system.
- b) Write note on 1. Time sharing system 2. Real time system.
- c) Explain process life cycle with neat diagram.
- d) What is process? Explain scheduling criteria.
- e) Explain necessary conditions for Deadlock.

#### 3. Solve any two:

20

- a) Explain any two scheduling algorithms with example.
- b) How will you prevent deadlock? Explain.
- c) What is swapping? Explain contiguous allocation.

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# **SLR-EP-146(b)**

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# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

### MCQ/Objective Type Questions

Marks: 10

1. Choose the correct answer:

 $(10 \times 1 = 10)$ 

- 1) In operating system, each process has its own
  - a) address space and global variables
  - b) open files
  - c) pending alarms, signals and signal handlers
  - d) all of the mentioned
- 2) In Unix, which system call creates the new process?
  - a) fork

b) create

c) new

- d) none of the mentioned
- 3) Which module gives control of the CPU to the process selected by the short-term scheduler?
  - a) dispatcher

b) interrupt

c) scheduler

- d) none of the mentioned
- 4) The interval from the time of submission of a process to the time of completion is termed as
  - a) waiting time

b) turnaround time

c) response time

d) throughput



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5)	A process is selected from the _ to be executed.	queue by the	scheduler,	
	a) blocked, short term	b) wait, long term		
	c) ready, short term	d) ready, long term		
6)	Round robin scheduling falls und	ler the category of		
	a) Non preemptive scheduling			
	b) Preemptive scheduling			
	c) None of these			
	d) All of the above			
7)	Which of the following condition	is required for deadlock to be	possible?	
	a) mutual exclusion			
	b) a process may hold allocate other resources	d resources while awaiting a	ssignment of	
	c) no resource can be forcibly re	emoved from a process holdir	ng it	
	d) all of the mentioned			
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 mentione	d	
9)	What is operating system?			
	a) Collection of programs that m	anages hardware resources		
	b) System service provider to the	e application programs		
	c) Link to interface the hardware	and application programs		
	d) All of the mentioned			
10)	Which one of the following is NO			
	<ul> <li>a) kernel is the program that co system</li> </ul>	onstitutes the central core of	the operating	
	<ul><li>b) kernel is the first part of ope booting</li></ul>	erating system to load into m	emory during	
	<ul><li>c) kernel is made of various mo operating system</li></ul>	odules which can not be load	ed in running	
	d) kernel remains in the memory	/ during the entire computer s	ession	



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# T.E. (Part – II) (Electronics and Telecommunication Engineering) Examination, 2016 (Self Learning) OPERATING SYSTEM

Day and Date: Saturday, 26-11-2016 Marks: 40

Time: 10.00 a.m. to 1.00 p.m.

## 2. Solve any four:

20

- a) What is spooling? Explain simple batch system.
- b) Write note on 1. Time sharing system 2. Real time system.
- c) Explain process life cycle with neat diagram.
- d) What is process? Explain scheduling criteria.
- e) Explain necessary conditions for Deadlock.

#### 3. Solve any two:

20

- a) Explain any two scheduling algorithms with example.
- b) How will you prevent deadlock? Explain.
- c) What is swapping? Explain contiguous allocation.

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## SLR-EP-146(c)

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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

## MCQ/Objective Type Questions

Marks: 10

1. Choose the correct answer:

10

- 1) A mobile robot
  - a) acts as a transportation system, like a "mail mobile"
  - b) imitates some human senses
  - c) performs manufacturing tasks like painting cars
  - d) is another name for virtual reality
- 2) What is the name for the space inside which a robot unit operates?
  - a) environment

b) spatial base

c) danger zone

- d) work envelop
- 3) The number of moveable joints in the base, the arm and the end effectors of the robot determines
  - a) degrees of freedom
- b) payload capacity

c) operational limits

- d) flexibility
- 4) Which of the following terms is not one of the four basic parts of a robot?
  - a) peripheral tools

b) sensor

c) controller

- d) drive
- 5) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor

b) Motion sensor

c) Action sensor

d) Touch sensor



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6)	Which of the following is a device device and changes the output if red a) Microprocessor c) Sensing device	quire b)	•
7)	Which of the following is an automa line? a) Industrial robot c) Domestic robot	b)	nachine that works on an assembly Assembly robot Android
8)	things b) machine that thinks like a humar c) machine that replaces a human b tasks	n Iy pei	nimics the motor activities of living rforming complex mental processing s the place of human in adventures
9)	Which of the basic parts of a robot us that could be programmed to determ a) sensor b) controller	nine	•
10)	Computer-controlled machines that are a) Virtual reality c) Knowledge-based systems	b)	ic the motor activities of living things Robotics Machines that think like a human

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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Marks: 40 Time: 10.00 a.m. to 1.00 p.m. **Instruction**: Solve any four out of Q.2 to Q.7. 2. What is a robot? Describe the function of the basic components of a robot. 10 3. Explain any two applications of robots in details. 10 4. Explain the following sensors used in robots 10 i) Touch and slip sensors velocity and acceleration sensors. ii) Proximity sensor 5. Draw and explain components of machine vision system. 10 6. Explain microprocessor based robot controller. 10 10 7. Solve the following: a) With the help of neat sketches, explain briefly the various illumination techniques. b) Draw and explain block diagram of MEMS.

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## SLR-EP - 146(c)

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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

## MCQ/Objective Type Questions

Marks: 10

1. Choose the correct answer:

10

- 1) Which of the basic parts of a robot unit would include the computer circuitry that could be programmed to determine what the robot would do?
  - a) sensor
- b) controller
- c) arm
- d) drive
- Computer-controlled machines that mimic the motor activities of living things are
  - a) Virtual reality

- b) Robotics
- c) Knowledge-based systems
- d) Machines that think like a human
- 3) Which of the following is an automated machine that works on an assembly line?
  - a) Industrial robot
  - b) Assembly robot
  - c) Domestic robot
  - d) Android
- 4) A robot is a
  - a) computer-controlled machine that mimics the motor activities of living things
  - b) machine that thinks like a human
  - c) machine that replaces a human by performing complex mental processing tasks
  - d) type of virtual reality device that takes the place of human in adventures



- 5) A mobile robot
  - a) acts as a transportation system, like a "mail mobile"
  - b) imitates some human senses
  - c) performs manufacturing tasks like painting cars
  - d) is another name for virtual reality
- 6) What is the name for the space inside which a robot unit operates?
  - a) environment

b) spatial base

c) danger zone

- d) work envelop
- 7) The number of moveable joints in the base, the arm and the end effectors of the robot determines
  - a) degrees of freedom

b) payload capacity

c) operational limits

- d) flexibility
- 8) Which of the following terms is not one of the four basic parts of a robot?
  - a) peripheral tools

b) sensor

c) controller

- d) drive
- 9) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor

b) Motion sensor

c) Action sensor

- d) Touch sensor
- 10) Which of the following is a device that receives information from an input device and changes the output if required?
  - a) Microprocessor

b) Actuator

c) Sensing device

d) Controller



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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Marks: 40 Time: 10.00 a.m. to 1.00 p.m. **Instruction**: Solve any four out of Q.2 to Q.7. 2. What is a robot? Describe the function of the basic components of a robot. 10 3. Explain any two applications of robots in details. 10 4. Explain the following sensors used in robots 10 i) Touch and slip sensors velocity and acceleration sensors. ii) Proximity sensor 5. Draw and explain components of machine vision system. 10 6. Explain microprocessor based robot controller. 10 10 7. Solve the following: a) With the help of neat sketches, explain briefly the various illumination techniques. b) Draw and explain block diagram of MEMS.

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# SLR-EP-146(c)

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## T.E. (E & TC) (Part – II) Examination, 2016 **ROBOTICS (Self Learning)**

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

the robot determines a) degrees of freedom

c) operational limits

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

> > : 10

10

		MCQ/Objective Typ	pe Questions	
				Marks
1. Ch	oose the correct an	swer:		
1)	Which of the follow object?	ring is a sensor that ı	measures the mo	vement of an
	<ul><li>a) Pressure senso</li><li>c) Action sensor</li></ul>		o) Motion sensor d) Touch sensor	
2)				ation from an input
3)		parts of a robot unit ammed to determine b) controller	e what the robot w	•
4)	Computer-controlle are	ed machines that mir	mic the motor activ	vities of living things
	<ul><li>a) Virtual reality</li><li>c) Knowledge-bas</li></ul>		o) Robotics d) Machines that	think like a human

5) The number of moveable joints in the base, the arm and the end effectors of

b) payload capacity

d) flexibility

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6)	Which of the	following	terms is not	one of the	four basic	parts of a robot?

a) peripheral tools

b) sensor

c) controller

d) drive

#### 7) A mobile robot

- a) acts as a transportation system, like a "mail mobile"
- b) imitates some human senses
- c) performs manufacturing tasks like painting cars
- d) is another name for virtual reality
- 8) What is the name for the space inside which a robot unit operates?
  - a) environment

b) spatial base

c) danger zone

- d) work envelop
- 9) Which of the following is an automated machine that works on an assembly line?
  - a) Industrial robot

b) Assembly robot

c) Domestic robot

d) Android

#### 10) A robot is a

- a) computer-controlled machine that mimics the motor activities of living things
- b) machine that thinks like a human
- c) machine that replaces a human by performing complex mental processing tasks
- d) type of virtual reality device that takes the place of human in adventures

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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Marks: 40 Time: 10.00 a.m. to 1.00 p.m. **Instruction**: Solve any four out of Q.2 to Q.7. 2. What is a robot? Describe the function of the basic components of a robot. 10 3. Explain any two applications of robots in details. 10 4. Explain the following sensors used in robots 10 i) Touch and slip sensors velocity and acceleration sensors. ii) Proximity sensor 5. Draw and explain components of machine vision system. 10 6. Explain microprocessor based robot controller. 10 10 7. Solve the following: a) With the help of neat sketches, explain briefly the various illumination techniques. b) Draw and explain block diagram of MEMS.

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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Max. Marks: 50

Time: 10.00 a.m. to 1.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in Answer Book Page No. 3. Each question carries one mark.

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

## MCQ/Objective Type Questions

Marks: 10

1	Choose th	a corract	anewor
1.	Choose in	e correct	answer.

10

- 1) The number of moveable joints in the base, the arm and the end effectors of the robot determines
  - a) degrees of freedom

b) payload capacity

c) operational limits

- d) flexibility
- 2) Which of the following terms is not one of the four basic parts of a robot?
  - a) peripheral tools

b) sensor

c) controller

- d) drive
- 3) Which of the following is a sensor that measures the movement of an object?
  - a) Pressure sensor

b) Motion sensor

c) Action sensor

- d) Touch sensor
- 4) Which of the following is a device that receives information from an input device and changes the output if required?
  - a) Microprocessor

b) Actuator

c) Sensing device

- d) Controller
- 5) Which of the following is an automated machine that works on an assembly line?
  - a) Industrial robot

b) Assembly robot

c) Domestic robot

d) Android



- 6) A robot is a
  - a) computer-controlled machine that mimics the motor activities of living things
  - b) machine that thinks like a human
  - c) machine that replaces a human by performing complex mental processing tasks
  - d) type of virtual reality device that takes the place of human in adventures
- 7) Which of the basic parts of a robot unit would include the computer circuitry that could be programmed to determine what the robot would do?
  - a) sensor
- b) controller
- c) arm
- d) drive
- 8) Computer-controlled machines that mimic the motor activities of living things are
  - a) Virtual reality

- b) Robotics
- c) Knowledge-based systems
- d) Machines that think like a human

- 9) A mobile robot
  - a) acts as a transportation system, like a "mail mobile"
  - b) imitates some human senses
  - c) performs manufacturing tasks like painting cars
  - d) is another name for virtual reality
- 10) What is the name for the space inside which a robot unit operates?
  - a) environment

b) spatial base

c) danger zone

d) work envelop

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# T.E. (E & TC) (Part – II) Examination, 2016 ROBOTICS (Self Learning)

Day and Date: Saturday, 26-11-2016 Marks: 40 Time: 10.00 a.m. to 1.00 p.m. **Instruction**: Solve any four out of Q.2 to Q.7. 2. What is a robot? Describe the function of the basic components of a robot. 10 3. Explain any two applications of robots in details. 10 4. Explain the following sensors used in robots 10 i) Touch and slip sensors velocity and acceleration sensors. ii) Proximity sensor 5. Draw and explain components of machine vision system. 10 6. Explain microprocessor based robot controller. 10 10 7. Solve the following: a) With the help of neat sketches, explain briefly the various illumination techniques. b) Draw and explain block diagram of MEMS.

A) 0.5

B) 1.0

# **SLR-EP - 147**

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# T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016 INDUSTRIAL ELECTRONICS (Old)

			ELECTRONICS (Old)	
-	Date : Saturday, 10 0.00 a.m. to 1.00 p			Total Marks : 100
	Instructions :	Book Page No. 3. E. 2) Answer MCQ/Object	ach question carries one ma etive type questions on Pag P/Q/R/S) on Top of Page. indicate full marks.	first 30 minutes in Answer ark. ge No. 3 only. Don't forget to
		MCQ/Object	ive Type Questions	
Duration	: 30 Minutes			Marks : 20
1. Cho	oose the correct ans	swer:		(20×1=20)
1)	The SCR is turned A) Forward curre C) Holding curre	_	ent falls below B) Breakover voltage D) Latching current	•
2)	The object of congate against  A) Overvoltage C) Noise signals	necting resistance and c	apacitance across gate circu B) dv/dt D) None of these	iit is to protect the thyristor
3)	An UJT exhibits n A) Before the bre C) After the valle	•	B) Between peak and D) Both (A) and (C)	d valley point
4)	<ul><li>A) Field effect ar</li><li>B) Semiconducte</li></ul>	nd MOS technology or and TTL ogy and CMOS technolog	and	
5)	The SCR is a A) Two-directions C) Three-direction	al	B) Uni-directional D) Four-directional	
6)	Thyristor equivale A) SCR	ent of thyratron tube is B) UJT	C) Diac	D) Triac
7)		DC voltage AC voltage AC voltage at same free	uency voltage at load frequency	
8)	A single phase ful A) RLC overdam C) RLC critically	aped	rate in load commutation mo B) RLC underdamped D) None of these	
9)	The ratio of latching	ng current to holding curr	ent SCR is	

C) 1.5

D) 2.5

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10)	The single pulse modula equal to	tion of PWM inverter, th	ird h	narmonics can be elir	nina	ated of pulse width is
	A) 30°	B) 60°	C)	120°	D)	None of these
11)	TRIAC cannot be used in A) AC voltage regulator C) Solid state type of so			Cycloconverter Inverter		
12)	For continuous conduction A) $(\pi - \alpha)$ radians C) $\alpha$ radians	on, in a single phase full	B)	verter each pair of S $\pi$ radians $(\pi + \alpha)$ radians	CRs	s conducts for
13)	In a single phase full cor 133 V respectively, then	the firing angle is		peak and average va 70°		
14)	<ul><li>A) 40°</li><li>Chopper control for DC n</li><li>A) Input voltage</li><li>C) Both A) and B)</li></ul>	B) 50° notor provides variation	in B)	Frequency None of the above	ט)	130°
15)	Which one of the followin A) BJT	g is the most suitable de B) GTO		for dc-to-dc converte MOSFET	er ? D)	Thyristor
16)	In chopper, the waveford A) discontinuous, contin C) both continuous		B)	ages are respectively continuous, disconti both discontinuous		us
17)	A step up chopper has \text{\text{this chopper is given by}}	's as the source voltage	anc	I ' $lpha$ ' as the duty cycle	e. Th	ne output voltage for
	A) Vs. $(1 + \alpha)$	B) $\frac{Vs}{(1+\alpha)}$	C)	Vs. $(1 - \alpha)$	D)	$\frac{Vs}{(1-\alpha)}$
18)	Choose the correct state A) MOSFET is a uncon B) MOSFET is a voltag C) MOSFET is a curren D) MOSFET is a tempe	trolled device e controlled device t controlled device				
19)	The cycloconverter requi A) Natural commutation B) Forced commutation C) Forced commutation D) Forced commutation	n in both step-up and ste n in both step-up and ste n in step-up cycloconver	p do p do ter	wn cycloconverter wn cycloconverter		
20)	Induction heating is used A) Insulating materials B) Magnetic materials C) Conducting materials D) Both magnetic and n	6				



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# T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016 INDUSTRIAL ELECTRONICS (Old)

Day and Date: Saturday, 10-12-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m

Instructions: 1) Figures to the right indicate full marks.

2) Assume data, if necessary.3) All questions are compulsory.

SECTION - I

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

 $(4 \times 6 = 24)$ 

- a) Explain turn ON and turn OFF mechanism of SCR.
- b) Explain how to protect the SCR under abnormal conditions over current, over voltage, thermal and dv/dt.
- c) Derive expression Fourier series for line current, input power factor of single-phase bridge converter.
- d) Explain construction, operation and characteristics of GTO.
- e) How many structures are there for power MOSFETs and describe any one of them with their advantages and disadvantages?
- f) Compare single phase half controlled and fully controlled converter.

#### 3. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Explain AC power control using TRIAC
  - i) Fan regulator
  - ii) Lamp dimmer
- b) Classify and explain different types of commutation techniques for converter circuits.
- c) Explain three phase half wave converter with resistive load and derive expression for average output voltage.

#### SECTION - II

#### 4. Attempt any four of the following:

 $(4 \times 6 = 24)$ 

- a) What is cycloconverter? Explain the operation of 1- $\phi$  to 1- $\phi$  AC cycloconverter.
- b) Discuss about single phase separately excited DC motor drive with neat sketch.
- c) Explain the operation of single phase half bridge inverter for RL loads with the help of neat circuit diagram and necessary waveforms.



- d) Discuss the working of a single phase parallel inverter and its commutation process with neat circuit diagram and necessary waveforms.
- e) Discuss the working of a Morgan's chopper circuit.
- f) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle.
- 5. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Write notes:
  - i) HVDC transmission
  - iii) Static circuit breakers.
- b) Explain the operation of 3-  $\phi$  bridge inverter for 180 degree mode of operation with aid of relevant phase and line voltage waveforms.
- c) Classify and explain control techniques of dc to dc converters.

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	T.E. (Electronics and Telecommu Examinati	• • • • • • • • • • • • • • • • • • • •	rt – II)
	INDUSTRIAL ELE	-	
-	Date : Saturday, 10-12-2016 0.00 a.m. to 1.00 p.m.		Total Marks : 100
	<del>_</del>	question carries <b>one</b> mark. • <b>type questions on Page No. 3 only</b> / <b>R/S) on Top of Page.</b> cate <b>full</b> marks.	
Domatica	MCQ/Objective T	Type Questions	Mayler - 00
	: 30 Minutes		Marks : 20
	oose the correct answer:	t voltagos are respectively	(20×1=20)
')	In chopper, the waveforms for input and output A) discontinuous, continuous C) both continuous	B) continuous, discontinuous D) both discontinuous	
2)	A step up chopper has Vs as the source voltage this chopper is given by		_
	A) Vs. $(1 + \alpha)$ B) Vs/ $(1 + \alpha)$	C) Vs. $(1 - \alpha)$ D) Vs/(1	- α <b>)</b>
3)	Choose the correct statement.  A) MOSFET is a uncontrolled device B) MOSFET is a voltage controlled device C) MOSFET is a current controlled device D) MOSFET is a temperature controlled device	е	
4)	The cycloconverter require natural or forced cor A) Natural commutation in both step-up and st B) Forced commutation in both step-up and st C) Forced commutation in step-up cycloconve D) Forced commutation in step-down cyclocor	tep down cycloconverter ep down cycloconverter erter	
5)	Induction heating is used for A) Insulating materials B) Magnetic materials C) Conducting materials D) Both magnetic and non-magnetic materials		
6)	The SCR is turned-off when the anode current factors.  A) Forward current rating  C) Holding current	falls below B) Breakover voltage D) Latching current	
7)	The object of connecting resistance and capac gate against  A) Overvoltage  C) Noise signals	eitance across gate circuit is to protect B) dv/dt D) None of these	ct the thyristor

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8)	An UJT exhibits negative (A) Before the break point (C) After the valley point			Between peak and v Both (A) and (C)	alle	y point
9)	The MOSFET combines the A) Field effect and MOS B) Semiconductor and TO MOS technology and CO None of the mentioned	technology ΓL CMOS technology	8	and		
10)	The SCR is aA) Two-directional C) Three-directional	switch.	,	Uni-directional Four-directional		
11)	Thyristor equivalent of thy A) SCR	ratron tube is B) UJT	C)	Diac	D)	Triac
12)	Cycloconverter converts  A) AC voltage to DC voltage  B) DC voltage to AC voltage  C) AC voltage to AC voltage  D) AC voltage at supply f	age age at same frequency	e at	load frequency		
13)	A single phase full bridge A) RLC overdamaped C) RLC critically damped		B)	d commutation mode RLC underdamped None of these	in c	ase load consists of
14)	The ratio of latching currer A) 0.5	nt to holding current SC B) 1.0		1.5	D)	2.5
15)	The single pulse modulation equal to	on of PWM inverter, thi	rd h	armonics can be elin	nina	ted of pulse width is
	A) 30°	B) 60°	C)	120°	D)	None of these
16)	<ul><li>TRIAC cannot be used in</li><li>A) AC voltage regulator</li><li>C) Solid state type of sw</li></ul>	itch		Cycloconverter Inverter		
17)	For continuous conduction A) $(\pi - \alpha)$ radians C) $\alpha$ radians	n, in a single phase full	B)	verter each pair of Some $\pi$ radians $(\pi + \alpha)$ radians	CRs	conducts for
18)	In a single phase full conv 133 V respectively, then the A) 40°			peak and average va		s of 325 V and 130°
19)	Chopper control for DC mo A) Input voltage C) Both A) and B)	otor provides variation i	B)	Frequency None of the above		
20)	Which one of the following A) BJT	is the most suitable dev B) GTO		for dc-to-dc converte MOSFET		Thyristor



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# T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016 INDUSTRIAL ELECTRONICS (Old)

Day and Date: Saturday, 10-12-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m

Instructions: 1) Figures to the right indicate full marks.

2) Assume data, if necessary.3) All questions are compulsory.

SECTION - I

2. Attempt any four of the following

 $(4 \times 6 = 24)$ 

- a) Explain turn ON and turn OFF mechanism of SCR.
- b) Explain how to protect the SCR under abnormal conditions over current, over voltage, thermal and dv/dt.
- c) Derive expression Fourier series for line current, input power factor of single-phase bridge converter.
- d) Explain construction, operation and characteristics of GTO.
- e) How many structures are there for power MOSFETs and describe any one of them with their advantages and disadvantages?
- f) Compare single phase half controlled and fully controlled converter.

3. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Explain AC power control using TRIAC
  - i) Fan regulator
  - ii) Lamp dimmer
- b) Classify and explain different types of commutation techniques for converter circuits.
- c) Explain three phase half wave converter with resistive load and derive expression for average output voltage.

SECTION - II

4. Attempt any four of the following:

 $(4 \times 6 = 24)$ 

- a) What is cycloconverter? Explain the operation of 1- $\phi$  to 1- $\phi$  AC cycloconverter.
- b) Discuss about single phase separately excited DC motor drive with neat sketch.
- c) Explain the operation of single phase half bridge inverter for RL loads with the help of neat circuit diagram and necessary waveforms.

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- d) Discuss the working of a single phase parallel inverter and its commutation process with neat circuit diagram and necessary waveforms.
- e) Discuss the working of a Morgan's chopper circuit.
- f) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle.
- 5. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Write notes:
  - i) HVDC transmission
  - iii) Static circuit breakers.
- b) Explain the operation of 3-  $\phi$  bridge inverter for 180 degree mode of operation with aid of relevant phase and line voltage waveforms.
- c) Classify and explain control techniques of dc to dc converters.

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# T.E. (Electronics and Telecommunication Engineering) (Part – II)

		amination, 2016 AL ELECTRONICS (Old)
	Date : Saturday, 10-12-2016 0.00 a.m. to 1.00 p.m.	Total Marks : 100
	Book Page No. 2) <b>Answer MCQ/0</b> <b>mention, Q.P.</b>	npulsory. It should be solved in first 30 minutes in Answer 3. Each question carries one mark. Display to the street of the street one of
	MCQ/O	bjective Type Questions
Duration	: 30 Minutes	Marks : 20
1. Cho	pose the correct answer:	(20×1=20)
1)	TRIAC cannot be used in  A) AC voltage regulator  C) Solid state type of switch	B) Cycloconverter D) Inverter
2)	For continuous conduction, in a single A) $(\pi - \alpha)$ radians C) $\alpha$ radians	phase full converter each pair of SCRs conducts for B) $\pi$ radians D) $(\pi + \alpha)$ radians
3)	In a single phase full converter, if outp 133 V respectively, then the firing and A) 40° B) 50°	out voltage has peak and average values of 325 V and lle is C) 70° D) 130°
4)	Chopper control for DC motor provide A) Input voltage C) Both A) and B)	s variation in B) Frequency D) None of the above
5)	Which one of the following is the most A) BJT B) GTO	suitable device for dc-to-dc converter ? C) MOSFET D) Thyristor
6)	In chopper, the waveforms for input a A) discontinuous, continuous C) both continuous	nd output voltages are respectively B) continuous, discontinuous D) both discontinuous
7)	A step up chopper has Vs as the southis chopper is given by	ce voltage and ' $\alpha$ ' as the duty cycle. The $$ output voltage for
	A) Vs. $(1 + \alpha)$ B) Vs/ $(1 + \alpha)$	(a) C) Vs. $(1 - \alpha)$ D) Vs/ $(1 - \alpha)$
8)	Choose the correct statement.	

- A) MOSFET is a uncontrolled device
- B) MOSFET is a voltage controlled device
- C) MOSFET is a current controlled device
- D) MOSFET is a temperature controlled device



9)	<ul> <li>The cycloconverter require natural or forced com</li> <li>A) Natural commutation in both step-up and ste</li> <li>B) Forced commutation in both step-up and ste</li> <li>C) Forced commutation in step-up cycloconver</li> <li>D) Forced commutation in step-down cycloconver</li> </ul>	ep down cycloconverter ep down cycloconverter ter
10)	Induction heating is used for A) Insulating materials B) Magnetic materials C) Conducting materials D) Both magnetic and non-magnetic materials	
11)	The SCR is turned-off when the anode current fa A) Forward current rating C) Holding current	alls below B) Breakover voltage D) Latching current
12)	The object of connecting resistance and capacit gate against  A) Overvoltage  C) Noise signals	tance across gate circuit is to protect the thyristor  B) dv/dt D) None of these
13)	<ul><li>An UJT exhibits negative resistance region</li><li>A) Before the break point</li><li>C) After the valley point</li></ul>	<ul><li>B) Between peak and valley point</li><li>D) Both (A) and (C)</li></ul>
14)	The MOSFET combines the areas of	and
15)	The SCR is a switch.  A) Two-directional  C) Three-directional	B) Uni-directional D) Four-directional
16)	Thyristor equivalent of thyratron tube is A) SCR B) UJT	C) Diac D) Triac
17)	Cycloconverter converts  A) AC voltage to DC voltage  B) DC voltage to AC voltage  C) AC voltage to AC voltage at same frequency  D) AC voltage at supply frequency to AC voltage	
18)	<ul><li>A single phase full bridge inverter can operate in</li><li>A) RLC overdamaped</li><li>C) RLC critically damped</li></ul>	n load commutation mode in case load consists of B) RLC underdamped D) None of these
19)	The ratio of latching current to holding current So A) 0.5 B) 1.0	CR is C) 1.5 D) 2.5
20)	The single pulse modulation of PWM inverter, the equal to A) 30° B) 60°	nird harmonics can be eliminated of pulse width is  C) 120°  D) None of these



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# T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016 INDUSTRIAL ELECTRONICS (Old)

Day and Date: Saturday, 10-12-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m

Instructions: 1) Figures to the right indicate full marks.

2) Assume data, if necessary.3) All questions are compulsory.

SECTION - I

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

 $(4 \times 6 = 24)$ 

- a) Explain turn ON and turn OFF mechanism of SCR.
- b) Explain how to protect the SCR under abnormal conditions over current, over voltage, thermal and dv/dt.
- c) Derive expression Fourier series for line current, input power factor of single-phase bridge converter.
- d) Explain construction, operation and characteristics of GTO.
- e) How many structures are there for power MOSFETs and describe any one of them with their advantages and disadvantages?
- f) Compare single phase half controlled and fully controlled converter.

#### 3. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Explain AC power control using TRIAC
  - i) Fan regulator
  - ii) Lamp dimmer
- b) Classify and explain different types of commutation techniques for converter circuits.
- c) Explain three phase half wave converter with resistive load and derive expression for average output voltage.

#### SECTION - II

#### 4. Attempt any four of the following:

 $(4 \times 6 = 24)$ 

- a) What is cycloconverter? Explain the operation of 1- $\phi$  to 1- $\phi$  AC cycloconverter.
- b) Discuss about single phase separately excited DC motor drive with neat sketch.
- c) Explain the operation of single phase half bridge inverter for RL loads with the help of neat circuit diagram and necessary waveforms.



- d) Discuss the working of a single phase parallel inverter and its commutation process with neat circuit diagram and necessary waveforms.
- e) Discuss the working of a Morgan's chopper circuit.
- f) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle.
- 5. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Write notes:
  - i) HVDC transmission
  - iii) Static circuit breakers.
- b) Explain the operation of 3-  $\phi$  bridge inverter for 180 degree mode of operation with aid of relevant phase and line voltage waveforms.
- c) Classify and explain control techniques of dc to dc converters.

A) BJT

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# T.E. (Electronics and Telecommunication Engineering) (Part – II)

	1.2. (2.0000)	Exami	nation,	_	J9	,, (1 a.t 11)	
		INDUSTRIAL E	ELECTF	ONICS (Old)			
-	Date : Saturday, 10-12 0.00 a.m. to 1.00 p.m.					Total	Marks : 100
	2)	Q. No. 1 is comput Book Page No. 3. E. Answer MCQ/Object mention, Q.P. Set ( Figures to the right Assume data, if neo	ach quest ctive type (P/Q/R/S) indicate 1	ion carries <b>one</b> ma <b>questions on Pag</b> <b>on Top of Page</b> .	ırk.		
		MCQ/Object	ive Type	Questions			
Duration	: 30 Minutes						Marks : 20
	oose the correct answe						(20×1=20)
1)	Thyristor equivalent (A) SCR	of thyratron tube is B) UJT	C)	Diac	D)	Triac	
2)		C voltage		load frequency			
3)	A single phase full br A) RLC overdamape C) RLC critically dar	ed	B)	d commutation mo RLC underdamped None of these		case load cons	sists of
4)	The ratio of latching of	current to holding curr	ent SCR is	3			
	A) 0.5	B) 1.0	,	1.5	,	2.5	
5)	equal to					•	
0)	A) 30°	B) 60°	C)	120°	D)	None of thes	е
6)	TRIAC cannot be use A) AC voltage regula C) Solid state type of	ator	,	Cycloconverter Inverter			
7)	For continuous cond A) $(\pi - \alpha)$ radians C) $\alpha$ radians	uction, in a single pha	B)	verter each pair of $\pi$ radians $(\pi + \alpha)$ radians	SCR	s conducts for	
8)		converter, if output vonen the firing angle is  B) 50°	-	peak and average 70°		s of 325 V and	d
9)	Chopper control for DA Input voltage C) Both A) and B)	,	iation in B)	Frequency None of the above	ŕ		

10) Which one of the following is the most suitable device for dc-to-dc converter?

C) MOSFET

B) GTO

D) Thyristor

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11)	A) discontinuous, contin     C) both continuous		· ·	B)	continuous, disconti both discontinuous		ıs
12)	A step up chopper has V this chopper is given by	s as t	the source voltage	and	I ' $lpha$ ' as the duty cycle	e. Th	e output voltage for
	A) Vs. $(1 + \alpha)$	B)	$Vs/(1+\alpha)$	C)	Vs. $(1 - \alpha)$	D)	$\frac{Vs}{(1-\alpha)}$
13)	Choose the correct states A) MOSFET is a uncont B) MOSFET is a voltage C) MOSFET is a curren D) MOSFET is a temper	rolled con t cont	d device trolled device trolled device				
14)	The cycloconverter requi A) Natural commutation B) Forced commutation C) Forced commutation D) Forced commutation	in bo in bo in ste	oth step-up and ste oth step-up and ste op-up cycloconvert	p do o do er	wn cycloconverter wn cycloconverter		
15)	<ul><li>Induction heating is used</li><li>A) Insulating materials</li><li>B) Magnetic materials</li><li>C) Conducting materials</li><li>D) Both magnetic and no</li></ul>	;	agnetic materials				
16)	The SCR is turned-off wh A) Forward current rating C) Holding current		e anode current fa	B)	elow Breakover voltage Latching current		
17)	The object of connecting gate against	resis	stance and capacit		-	is to	protect the thyristor
	<ul><li>A) Overvoltage</li><li>C) Noise signals</li></ul>			,	dv/dt None of these		
18)	<ul><li>An UJT exhibits negative</li><li>A) Before the break poir</li><li>C) After the valley point</li></ul>	nt	stance region		Between peak and v Both (A) and (C)	alley	point /
19)	The MOSFET combines  A) Field effect and MOS  B) Semiconductor and T  C) MOS technology and  D) None of the mentione	tech TL CMC	inology	6	and		
20)	The SCR is a A) Two-directional C) Three-directional	_ swi	itch.	,	Uni-directional Four-directional		



Seat	
No.	

# T.E. (Electronics and Telecommunication Engineering) (Part – II) Examination, 2016 INDUSTRIAL ELECTRONICS (Old)

Day and Date: Saturday, 10-12-2016 Marks: 80

Time: 10.00 a.m. to 1.00 p.m

*Instructions*: 1) Figures to the **right** indicate **full** marks.

2) Assume data, if necessary.3) All questions are compulsory.

SECTION - I

2. Attempt any four of the following

 $(4 \times 6 = 24)$ 

- a) Explain turn ON and turn OFF mechanism of SCR.
- b) Explain how to protect the SCR under abnormal conditions over current, over voltage, thermal and dv/dt.
- c) Derive expression Fourier series for line current, input power factor of single-phase bridge converter.
- d) Explain construction, operation and characteristics of GTO.
- e) How many structures are there for power MOSFETs and describe any one of them with their advantages and disadvantages?
- f) Compare single phase half controlled and fully controlled converter.

3. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Explain AC power control using TRIAC
  - i) Fan regulator
  - ii) Lamp dimmer
- b) Classify and explain different types of commutation techniques for converter circuits.
- c) Explain three phase half wave converter with resistive load and derive expression for average output voltage.

SECTION - II

4. Attempt any four of the following:

 $(4 \times 6 = 24)$ 

- a) What is cycloconverter? Explain the operation of 1- $\phi$  to 1- $\phi$  AC cycloconverter.
- b) Discuss about single phase separately excited DC motor drive with neat sketch.
- c) Explain the operation of single phase half bridge inverter for RL loads with the help of neat circuit diagram and necessary waveforms.



- d) Discuss the working of a single phase parallel inverter and its commutation process with neat circuit diagram and necessary waveforms.
- e) Discuss the working of a Morgan's chopper circuit.
- f) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage and duty cycle.
- 5. Attempt any two of the following:

 $(2 \times 8 = 16)$ 

- a) Write notes:
  - i) HVDC transmission
  - iii) Static circuit breakers.
- b) Explain the operation of 3-  $\phi$  bridge inverter for 180 degree mode of operation with aid of relevant phase and line voltage waveforms.
- c) Classify and explain control techniques of dc to dc converters.

a) 10Base5

# **SLR-EP - 148**

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Seat No.	Set	Р

# B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016 COMPUTER COMMUNICATION NETWORK

	COMPL	JTER COMMUN	VICATION NET	WORK
-	d Date : Tuesday, 2 3.00 p.m. to 6.00 p.			Total Marks: 100
	ir 2) <b>A</b>	n Answer Book Pag <b>Answer MCQ/Obj</b>	ge No. <b>3. Each</b> que <b>ective type ques</b>	olved in <b>first 30 minutes</b> estion carries <b>one</b> mark. <b>tions on Page No. 3 only.</b> P/Q/R/S) on Top of Page.
		MCQ/Objective	Type Questions	
Duratio	on : 30 Minutes			Marks : 20
1. Ch	oose the correct an	swer:		
1)		as a dedicated linl	k to every other ph	ou discover that every hysical location. Which d) Mesh
2)	In the OSI model, a) Network virtual b) File transfer, ac c) Mail service d) All of above	terminal		tion layer services ?
3)	communication?			on process to process
4)	<ul><li>a) Session</li><li>Number of links to</li><li>a) N(N – 1)/2</li></ul>	connect n nodes	c) Transport in a mesh topolog c) N	,
5)	The reminder of C a) Transmission E c) Retransmission	Frror occur	eiver is zero, mea b) No transmis d) None of the a	sion Error
6)	Frame	e does not carry a b) S-Frame		nber in HDLC. d) None of the above
7)	In CRS	•	•	,
•	a) Module 1	b) Module 2	c) Module 3	
8)	IFFF 802 3 uses	ca	hle	

b) 10Base2 c) 10baseT d) All above



	9)	Which of the follow	ring is a valid subne				
		<ul><li>a) 255.0.255.255</li><li>c) 255.255.254.0</li></ul>		,	0.0.0.255 255.255.255.25	6	
1	IU)	UDP is called a	trans	•		U	
	10)	a) Connectionless	trans . reliable	b)	Connectionless	. ur	nreliable
		c) Connection-orie				,	
1	11)	Errors in the heade	er or option fields of	far	n IP datagram re	qui	res a
		er	ror message.				
		a) Parameter prob	lem	b)	Source-Quench	1	
		c) Router-Solicitati		•	None of these		
1	12)	In case of Token Ri	ng networks, one b	it d	elay is associate	d w	vith
		mode of operation. a) Listen mode	h) Bynass mode	c)	Transmit	٩)	None of these
1	13)	IP multicast uses	b) bypass mode	υ,	Hansiiii	u)	None of these
'	10)	a) Class A address	S	b)	Class B addres	s	
		c) Class C addres	S	d)	Class B addres Class D addres	S	
1	14)	Which of the follow	ing standards used	d fo	r CSMA/CD LAN	۱?	
	•	a) IEEE 802.3	b) IEEE 802.2	c)	IEEE 802.5	d)	IEEE 802.4
1	15)	Problem of mappin	ig IP address to ph	ysi	cal address is so	olve	ed by
		a) ARP	b) RARP	c)	DHCP	d)	ICMP
1	16)	For early lease tern	nination, DHCP clie	ent	sends		message to
		the server. a) DHCPNACK		h)	DHCPACK		
		c) DHCPRELEASE	=	,	None of these		
1	17)	For distribution of li		,		a m	nethod is used ?
	'''	a) Shortest Path	Till otato paonoto, v		Flow based	9	
		c) Flooding		,	Distance Vecto	r Ro	outing
1	18)	DNS uses caching	for				
		a) Search mapping		,	Name Resolution	n	
		c) Optimizing sear		,	None of these		
1	19)	You are given a C subnets do you have		ith	26 bits for netw	ork	ing. How many
		a) 1	b) 2	c)	3	d)	4
2	20)	You are given a C	lass C network wit	th a	a subnet mask o	f 2	55.255.255.192
		how many host add					
		a) 30	b) 64	c)	126	d)	254



Seat	
No.	

# B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016 COMPUTER COMMUNICATION NETWORK

Day and Date: Tuesday, 29-11-2016

Time: 3.00 p.m. to 6.00 p.m.

### SECTION-I

### 2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) Explain in detail any two network Topologies with their advantages and disadvantages.
- b) Explain character stuffing method of framing.
- c) Draw and explain the function of each layer in TCP/IP Model.
- d) Explain hamming code method of error detection.
- e) Explain the pure ALOHA and slotted ALOHA protocol.

### 3. Attempt any two:

 $(2\times10=20)$ 

- a) Draw TCP segment format. Explain various fields in it. Explain how TCP establishes connection by three way handshaking.
- b) Explain IP addressing with Classes and their ranges.
- c) Explain along with suitable example CRC method of error detection.

#### SECTION - II

### 4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Write a short note on ARP.
- b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

Set P



-4-

- c) What is the relation between switch and bridge?
- d) What are the various Telnet options? Explain option negotiation.
- e) Discuss in detail process steps of SMTP.

# 5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain IEEE 802.3 Physical layer specifications.
- b) Explain shortest path routing.
- c) Draw and explain block schematic of Modem.

a) 30

a) Bus

# **SLR-EP - 148**

		III I <b>■■</b> I			OLI I-LI	170
Sea No					Set	Q
	`		nination,	2016	ering) (Part – I ORK	l)
-	and Date : Tuesd e : 3.00 p.m. to 6.	•			Total Marks	s : 100
	Instructions :	in Answer Boo 2) <b>Answer MC</b>	ok Page No. <b>D/Objectiv</b>	. 3. Each question e type question	ed in <b>first 30 minut</b> e on carries <b>one</b> mai ns <b>on Page No.</b> 3 2/R/S) on Top of	rk. <b>3 only.</b>
Dura	ation : 30 Minutes	MCQ/Obje	ctive Type	Questions	Mark	ks : 20
1.	Choose the corre 1) For early leas the server. a) DHCPNAC c) DHCPREL	e termination, DH	b)	ends DHCPACK None of these	message	to
	<ul><li>2) For distribution</li><li>a) Shortest F</li><li>c) Flooding</li><li>3) DNS uses can</li></ul>	ath	b)	h of the followin Flow based Distance Vecto	g method is used r Routing	?
	4) You are give subnets do you a) 1	g search cost n a Class C netv ou have ? b) 2	d) vork with 2 c)	3	orking. How mar	
	5) You are give	n a Class C netw	ork with a	subnet mask c	if 255 255 255 10	なつ

how many host addresses are there on each subnet?

of the following wiring topologies does this describe?

b) 64

b) Star

c) 126

c) Ring

6) When documenting a client's wide area network, you discover that every physical location has a dedicated link to every other physical location. Which

d) 254

d) Mesh



7)	In the OSI model, va) Network virtual b) File transfer, acc) Mail service d) All of above	terminal			lay	ver services ?
8)	Which of the follow communication?	ving OSI layers ha	ndl	es the function p	oroc	cess to process
	a) Session	b) Application	c)	Transport	d)	Presentation
9)	Number of links to a) $N(N-1)/2$			,		$N^2$
10)	The reminder of CI a) Transmission E c) Retransmission	rror occur	b)	No transmission	n E	rror
11)	Frame					
	a) I-Frame					
12)	In CRSa) Module 1	arithmetic is u	se	d to carry out the	div	vision.
	a) Module 1	b) Module 2	c)	Module 3	d)	Module 4
13)	IEEE 802.3 uses					
	a) 10Base5	b) 10Base2	c)	10baseT	d)	All above
14)	Which of the follow	ring is a valid subne	et n	nask value ?		
	a) 255.0.255.255		b)	0.0.0.255		
	c) 255.255.254.0		d)	255.255.255.25	6	
15)	UDP is called a	trans	po	rt protocol.		
•	a) Connectionless	, reliable	b)	Connectionless	, ur	reliable
	c) Connection-orie					
16)	Errors in the heade	er or option fields of ror message.	fan	IP datagram re	quii	res a
	a) Parameter prob	_	b)	Source-Quench	1	
	c) Router-Solicitat		,	None of these		
17)	In case of Token Ri mode of operation.	ng networks, one b	,		d w	ith
	a) Listen mode		c)	Transmit	d)	None of these
18)	IP multicast uses	, ,,	,		,	
,	a) Class A address	S	b)	Class B addres	s	
	c) Class C addres		,	Class D addres		
19)	Which of the follow		•			
,	a) IEEE 802.3	b) IEEE 802.2				IEEE 802.4
201	Problem of mappin	•	•		,	
	a) ARP	b) RARP	-	DHCP		ICMP
	~, / " "	~/	٠,		<i>⊶</i> ,	



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# B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016 COMPUTER COMMUNICATION NETWORK

Day and Date: Tuesday, 29-11-2016

Time: 3.00 p.m. to 6.00 p.m.

#### SECTION-I

### 2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) Explain in detail any two network Topologies with their advantages and disadvantages.
- b) Explain character stuffing method of framing.
- c) Draw and explain the function of each layer in TCP/IP Model.
- d) Explain hamming code method of error detection.
- e) Explain the pure ALOHA and slotted ALOHA protocol.

### 3. Attempt any two:

 $(2 \times 10 = 20)$ 

- a) Draw TCP segment format. Explain various fields in it. Explain how TCP establishes connection by three way handshaking.
- b) Explain IP addressing with Classes and their ranges.
- c) Explain along with suitable example CRC method of error detection.

#### SECTION - II

### 4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Write a short note on ARP.
- b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

Set Q



c) What is the relation between switch and bridge?

d) What are the various Telnet options? Explain option negotiation.

-4-

e) Discuss in detail process steps of SMTP.

# 5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain IEEE 802.3 Physical layer specifications.
- b) Explain shortest path routing.
- c) Draw and explain block schematic of Modem.

\_\_\_\_\_

c) Flooding

# **SLR-EP - 148**

No.	Seat No.		Set	R
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Б.	E. (Electronics a	Examination Examination TER COMMUN	on, 2	2016	,
_			ICAI	ION NEIW	
-	d Date : Tuesday, 29 3.00 p.m. to 6.00 p.r				Total Marks : 100
1	2) <b>A</b>	AnswerBook Page nswer MCQ/Obje	No. 3 <b>ctive</b>	3. Each questic type question	d in <b>first 30 minutes</b> on carries <b>one</b> mark. os <b>on Page No. 3 only.</b> o/R/S) on Top of Page.
		MCQ/Objective Ty	ype G	Questions	
Duratio	n : 30 Minutes				Marks: 20
1. Ch	oose the correct ans	swer:			
1)	Errors in the heade	er or option fields of For message.	f an If	P datagram red	quires a
	a) Parameter prob	_	b) S	Source-Quench	
	c) Router-Solicitati	on	d) N	lone of these	
2)	In case of Token Ri mode of operation.	ng networks, one b	it dela	ay is associate	d with
	a) Listen mode	b) Bypass mode	c) T	ransmit	d) None of these
3)	IP multicast uses				
	a) Class A address		•	lass B addres	
	c) Class C address		•	lass D addres	
4)	Which of the follow	•			
Ε\	a) IEEE 802.3	b) IEEE 802.2	•		d) IEEE 802.4
5)	Problem of mappin a) ARP	-	-		_
6)	For early lease tern	nination, DHCP clie	ent se	nds	message to
	the server.		5		
	a) DHCPNACK	-	,	HCPACK	
<b>-7</b> \	c) DHCPRELEASE		,	lone of these	o months and in the self O
7)	For distribution of li a) Shortest Path	rik state packets, v		of the following low based	y metnoa is usea ?

d) Distance Vector Routing



8)	DNS uses caching a) Search mapping b) Optimizing as a		b) Name Resolution	on	
9)	<ul> <li>c) Optimizing sear</li> <li>You are given a C</li> <li>subnets do you have</li> </ul>	class C network w	•	ork	ing. How many
	a) 1		c) 3	d)	4
10)	You are given a Chow many host add			of 2	55.255.255.192
	a) 30	b) 64	c) 126	d)	254
11)	of the following wiri	as a dedicated link	to every other phys s this describe?	ical	location. Which
	a) Bus	b) Star	c) Ring	d)	Mesh
12)	In the OSI model, va) Network virtual b) File transfer, acc c) Mail service d) All of above	terminal		ı lay	er services ?
13)	Which of the follow communication?	ving OSI layers ha	indles the function	pro	cess to process
	a) Session	b) Application	c) Transport	d)	Presentation
14)	Number of links to a) $N(N-1)/2$				$N^2$
15)	The reminder of CF a) Transmission E c) Retransmission	rror occur	eiver is zero, means b) No transmissio d) None of the abo	n E	rror
16)	Frame	e does not carry ar	ny sequence numbe	r in	HDLC.
•	a) I-Frame	_	c) U-Frame		
17)	In CRS			e div	rision.
	a) Module 1	b) Module 2	c) Module 3	d)	Module 4
18)	IEEE 802.3 uses				
	a) 10Base5	b) 10Base2	,	d)	All above
19)	Which of the follow	ring is a valid subn			
	a) 255.0.255.255		b) 0.0.0.255	6	
00)	c) 255.255.254.0	<b>.</b>	d) 255.255.255.25	Ö	
<b>∠</b> U)	UDP is called a		sport protocol. b) Connectionless	. , , , ,	oreliable
	c) Connection-orie		· · · ·	s, ui	II CIIADIC
	o, combodion one	, Jili chabic	a) 110110 01 111000		



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# B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016 COMPUTER COMMUNICATION NETWORK

Day and Date: Tuesday, 29-11-2016

Time: 3.00 p.m. to 6.00 p.m.

SECTION-I

### 2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) Explain in detail any two network Topologies with their advantages and disadvantages.
- b) Explain character stuffing method of framing.
- c) Draw and explain the function of each layer in TCP/IP Model.
- d) Explain hamming code method of error detection.
- e) Explain the pure ALOHA and slotted ALOHA protocol.

### 3. Attempt any two:

 $(2\times10=20)$ 

- a) Draw TCP segment format. Explain various fields in it. Explain how TCP establishes connection by three way handshaking.
- b) Explain IP addressing with Classes and their ranges.
- c) Explain alongwith suitable example CRC method of error detection.

#### SECTION - II

### 4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Write a short note on ARP.
- b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

Set R



c) What is the relation between switch and bridge?

d) What are the various Telnet options? Explain option negotiation.

-4-

e) Discuss in detail process steps of SMTP.

# 5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain IEEE 802.3 Physical layer specifications.
- b) Explain shortest path routing.
- c) Draw and explain block schematic of Modem.

Seat No.	Set	S
	<u>.                                      </u>	

# B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016 COMPUTER COMMUNICATION NETWORK

Day and Date : Tuesday, 29-11-2016	Total Marks: 100
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Time: 3.00 p.m. to 6.00 p.m.

c) Class C address

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

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

> > d) Class D address

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 20 1. Choose the correct answer: 1) \_\_\_\_\_ Frame does not carry any sequence number in HDLC. a) I-Frame d) None of the above b) S-Frame c) U-Frame arithmetic is used to carry out the division. 2) In CRS a) Module 1 b) Module 2 c) Module 3 d) Module 4 3) IEEE 802.3 uses cable. c) 10baseT b) 10Base2 a) 10Base5 d) All above 4) Which of the following is a valid subnet mask value? a) 255.0.255.255 b) 0.0.0.255 c) 255.255.254.0 d) 255.255.256 5) UDP is called a \_\_\_\_\_ transport protocol. a) Connectionless, reliable b) Connectionless, unreliable d) None of these c) Connection-oriented, Unreliable 6) Errors in the header or option fields of an IP datagram requires a error message. a) Parameter problem b) Source-Quench d) None of these c) Router-Solicitation 7) In case of Token Ring networks, one bit delay is associated with \_\_\_\_\_\_ mode of operation. a) Listen mode b) Bypass mode c) Transmit d) None of these 8) IP multicast uses a) Class A address b) Class B address



9)	Which of the follow a) IEEE 802.3	_				EEE 802.4	
10)	Problem of mapping a) ARP	g IP address to ph b) RARP	-		olved d) IC	-	
11)	For early lease term the server.	nination, DHCP cli	ent sends _			_ message to	1
	<ul><li>a) DHCPNACK</li><li>c) DHCPRELEASE</li></ul>	<u> </u>	b) DHCPA d) None o				
12)	For distribution of li a) Shortest Path	nk state packets, v	which of the b) Flow ba		ıg met	thod is used?	
	c) Flooding		d) Distance	e Vecto	r Rou	ting	
13)	<ul><li>DNS uses caching</li><li>a) Search mapping</li><li>c) Optimizing sear</li></ul>	J	b) Name F		on		
14)	You are given a C subnets do you have	lass C network w	,		orkin	g. How many	
	a) 1	b) 2	c) 3		d) 4		
15)	You are given a C how many host add				of 255	.255.255.192	
	a) 30	b) 64	c) 126		d) 2	54	
16)	When documentin physical location had of the following wiri	as a dedicated link	to every oth	er phys		•	
	a) Bus	b) Star	c) Ring		d) M	lesh	
17)	In the OSI model, va) Network virtual b) File transfer, acc c) Mail service	terminal		plicatior	ı layer	r services ?	
10\	d) All of above	ing OSI lovers ha	ndlag tha fu	ınation	orooo	oo to process	
10)	Which of the follow communication?				•	•	
40\	,	b) Application	, .		•	resentation	
19)	Number of links to a) $N(N-1)/2$		n a mesn to c) N	pology i	s = d) N	2	
20)	The reminder of CF						
	<ul><li>a) Transmission E</li><li>c) Retransmission</li></ul>		<ul><li>b) No tran</li><li>d) None of</li></ul>			or	
	0) 11 <del>0</del> 1141131111331011		a) INDITED	ו וווכ מטנ	7 V C		



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No.	

# B.E. (Electronics and Telecommunication Engineering) (Part – I) Examination, 2016 COMPUTER COMMUNICATION NETWORK

Day and Date: Tuesday, 29-11-2016

Time: 3.00 p.m. to 6.00 p.m.

### SECTION-I

### 2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) Explain in detail any two network Topologies with their advantages and disadvantages.
- b) Explain character stuffing method of framing.
- c) Draw and explain the function of each layer in TCP/IP Model.
- d) Explain hamming code method of error detection.
- e) Explain the pure ALOHA and slotted ALOHA protocol.

### 3. Attempt any two:

 $(2\times10=20)$ 

- a) Draw TCP segment format. Explain various fields in it. Explain how TCP establishes connection by three way handshaking.
- b) Explain IP addressing with Classes and their ranges.
- c) Explain along with suitable example CRC method of error detection.

#### SECTION - II

### 4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Write a short note on ARP.
- b) Explain various modes of operations in case of IEEE 802.5 Token Ring Network.

Set S



- c) What is the relation between switch and bridge?
- d) What are the various Telnet options? Explain option negotiation.
- e) Discuss in detail process steps of SMTP.

# 5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain IEEE 802.3 Physical layer specifications.
- b) Explain shortest path routing.
- c) Draw and explain block schematic of Modem.

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	В.	E. (E &	TC) (Part VLSI	-	xaminatior GN	າ, 2010	6	
•	d Date : Thurso 3.00 p.m. to 6.0	•	-2016				Max. I	Marks : 100
1	Instructions :	2) Figure 3) <b>Assu</b> 4) Q. No in Ans 5) <b>Answ</b>	es to the <b>rig</b> I <b>me</b> suitable In 1 is <b>compu</b> Iswer Book F Iver MCQ/OL	g <b>ht</b> ind e data i u <b>lsory</b> . Page N <b>ojectiv</b>	icate <b>maxim</b>	solved uestion i <b>ions o</b> i	in <b>first 30</b> carries <b>c</b> n <b>Page N</b>	one mark. lo. 3 only.
		MC	Q/Objective	е Туре	Questions			
Duratio	n : 30 Minutes							Marks : 20
1. Ch	oose the corre	ct answe	r:					(1×20=20)
1)	Under steady a) 0 W		_		ipated in CM 0.1 μ W		cuit is None	
	The symbol _ a) := c) =>			b) d)	<= None of abo			
3)	Transmission <ul><li>a) Pass Gate</li><li>c) Fail Gate</li></ul>		ZIMOS also	b)	as Pull – up ga Pull – down			
4)	The block of o internal signa a) Architectu	l or varial	ole in VHDL		tionship betv Package			out and
5)	To implement numbers of M	5 input N	OR gate us	ing CN	1OS logic red	quires _		
<b>2</b> )	a) 6	b)		,	10	d)	4	
6)	a) Generate c) If – then	s not a co	oncurrent sta	b)	าt. When else With – Sele	ct – wh	en	
7)	The problem a) Gates c) Combinati			b)	Sequential o	circuit		



8)	When an iterative a	-	-		
	statement provides			<del>-</del>	<del>-</del>
0/	a) Port map	b) For loop	C)	For Generate	d) None
9)	<ul><li>A process cannot h</li><li>a) Wait statement</li><li>c) Sensitivity list</li></ul>	ave	•	Wait statement None	and sensitivity list
10)	CLK'1 is an attribut a) EVENT	e type b) Delay	c)	Stable	d) None
11)	The behaviour of so a) State table	equential circuit is b) Truth table			r format called d) Both a) and b)
12)	Built in self test cor a) Shift register c) Compressor circ		•	Linear feedbac Both b) and c)	k shift register
13)	Logic block of FPG a) Macrocell c) Both a) and b)	A contains	,	Look-up table None	
14)	Stuck-at 0 and stuce a) Short circuit fauce) Short and open	lt	b)	lue to Open circuit fau None	ult
15)	Logic within the fun a) Product-of-some c) Both a) and b)		b)	is implemented Sum-of-product None	•
16)	Macrocell of CPLD a) Combinatorial c) Both a) and b)	can implement	b)	function. Sequential/regis None	stered
17)	Boundary Scan tec a) Scan path testin c) Both a) and b)		b)	Test access po None	ort
18)	To detect N bit sequal a) 2 N			chine, the numbe N – 1	
19)	A PLA has a a) programmable A c) a) and b) both	ND		programmable none of the abo	
20)	The macrocell regis	ster can be configu b) T		l as D and T	



SLR-EP – 149

Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 VLSI DESIGN

-3-

Day and Date: Thursday, 1-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **maximum** marks.

3) Assume suitable data if required.

SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- a) For CMOS inverter C = 50 fF, V = 3 V and F = 100 MHz calculate dynamic power consumed.
- b) What is pullup and pull down network in CMOS?
- c) What is Dataflow Modeling?
- d) Explain the concept of libraries.
- e) Write VHDL code for 3:8 decoder.

3. Solve **any three**:

 $(8 \times 3 = 24)$ 

a) Implement the function using CMOS logic:

i) 
$$y = a + (b + c) (d + e)$$

ii) 
$$y = (ab + \overline{cd})e$$
.

- b) Explain Operator overloading with example.
- c) Explain in detail VHDL Subprogram.
- d) Write VHDL code for 16: 1 multiplexer using structural modeling.

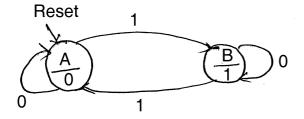


### SECTION - II

# 4. Solve any four:

 $(4 \times 4 = 16)$ 

a) Write a VHDL code given state diagram:



- b) Design J-K flipflop using state diagram.
- c) Write a short note on boundary scan.
- d) Write a test bench for 1 bit comparator.
- e) Compare CPLD and FPGA.

### 5. Solve any three:

- a) Explain in detail Macrocell.
- b) Explain in detail architecture of FPGA.
- c) Design state diagram and write VHDL code for coffee vending machine.
- d) Write a VHDL code for 2 × 2 multiplier using Add and Shift method.

c) =>

# **SLR-EP - 149**

No.	Seat No.		Set	Q
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	B.E. (E	& TC) (Part – I VLSI DE	) Examination, 2 ESIGN	2016
•	d Date : Thursday, 1- 3.00 p.m. to 6.00 p.m			Max. Marks : 100
	3) <b>As</b> 4) Q. I in A 5) <b>An</b>	ures to the <b>right</b> <b>sume</b> suitable da No. <b>1</b> is <b>compuls</b> Answer Book Pag <b>swer MCQ/Obje</b>	indicate <b>maximum</b> ata <b>if required</b> . <b>ory</b> . It should be solue No. <b>3</b> . <b>Each</b> ques active type question	n marks.  ved in <b>first 30 minutes</b> stion carries <b>one</b> mark. s <b>on Page No. 3 only. /R/S) on Top of Page.</b>
Duratio	n : 30 Minutes	ICQ/Objective T	ype Questions	Marks : 20
Durano	iii. 50 Miiiules			Marks . 20
1. Ch	oose the correct ansv	ver:		(1×20=20)
1)	Macrocell of CPLD c a) Combinatorial	an implement	function. b) Sequential/regi	
	c) Both a) and b)		d) None	
2)	Boundary Scan tech a) Scan path testing c) Both a) and b)		b) Test access po d) None	ort
3)	To detect N bit seque a) 2 N	ence using Moore b) N + 1	machine, the numb c) $N-1$	
4)	A PLA has a a) programmable AN c) a) and b) both	ND	<ul><li>b) programmable</li><li>d) none of the abo</li></ul>	
5)	The macrocell regist a) D	er can be configu o) T	ıred as c) D and T	
6)	Under steady state of a) 0 W	=	lissipated in CMOS c) 0.1 μ W	
7)	The symbola) :=	,	•	•

d) None of above



8)	Transmission Gate a) Pass Gate c) Fail Gate	in CMOS also call	b)	as Pull – up gate Pull – down gat	e	
9)	The block of code vinternal signal or va a) Architecture	ariable in VHDL		-		
10)	To implement 5 inp numbers of MOSFE	ut NOR gate using	,	· ·	•	•
	a) 6	b) 8	c)	10	d)	4
11)	,	,	,		u)	7
11)	a) Generate c) If – then	a concurrent states	b)	When else With – Select –	wh	en
12)	The problem of a c a) Gates c) Combinational c		b)	Sequential circu	uit	
13)	When an iterative a statement provides a) Port map	an easy way of ins	star	ntiating these co	mp	onents.
14)	A process cannot ha) Wait statement c) Sensitivity list	ave	•	Wait statement None	an	d sensitivity list
15)	CLK'1 is an attribut a) EVENT	e type b) Delay	c)	Stable	d)	None
16)	The behaviour of so a) State table	=				
17)	Built in self test cor a) Shift register c) Compressor circ		,	Linear feedbac Both b) and c)	k sł	nift register
18)	Logic block of FPG a) Macrocell c) Both a) and b)	A contains	,	Look-up table None		
19)	Stuck-at 0 and stude a) Short circuit fauc) Short and open	lt	b)	lue to Open circuit fau None	ult	
20)	Logic within the fun a) Product-of-some c) Both a) and b)		b)	is implemented Sum-of-product None		ing



SLR-EP – 149

Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 VLSI DESIGN

-3-

Day and Date: Thursday, 1-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **maximum** marks.

3) Assume suitable data if required.

SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- a) For CMOS inverter C = 50 fF, V = 3 V and F = 100 MHz calculate dynamic power consumed.
- b) What is pullup and pull down network in CMOS?
- c) What is Dataflow Modeling?
- d) Explain the concept of libraries.
- e) Write VHDL code for 3:8 decoder.

3. Solve **any three**:

 $(8 \times 3 = 24)$ 

a) Implement the function using CMOS logic:

i) 
$$y = a + (b + c) (d + e)$$

ii) 
$$y = (ab + \overline{cd})e$$
.

- b) Explain Operator overloading with example.
- c) Explain in detail VHDL Subprogram.
- d) Write VHDL code for 16: 1 multiplexer using structural modeling.

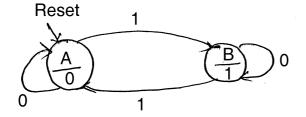


### SECTION - II

# 4. Solve any four:

 $(4 \times 4 = 16)$ 

a) Write a VHDL code given state diagram:



- b) Design J-K flipflop using state diagram.
- c) Write a short note on boundary scan.
- d) Write a test bench for 1 bit comparator.
- e) Compare CPLD and FPGA.

### 5. Solve any three:

- a) Explain in detail Macrocell.
- b) Explain in detail architecture of FPGA.
- c) Design state diagram and write VHDL code for coffee vending machine.
- d) Write a VHDL code for 2 × 2 multiplier using Add and Shift method.

Seat	Set	R
No.		•

# B.E. (E & TC) (Part – I) Examination, 2016 VLSI DESIGN

Day and Date: Thursday, 1-12-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

c) Both a) and b)

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

- 2) Figures to the **right** indicate **maximum** marks.
- 3) **Assume** suitable data **if required**.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

MCQ/Objective T	vpe Questions
Duration: 30 Minutes	Marks : 20
1. Choose the correct answer:	(1×20=20
<ol> <li>The behaviour of sequential circuit is</li> <li>a) State table</li> <li>b) Truth table</li> </ol>	described in tabular format called c) State diagram d) Both a) and b)
<ul><li>2) Built in self test contains</li><li>a) Shift register</li><li>c) Compressor circuit</li></ul>	<ul><li>b) Linear feedback shift register</li><li>d) Both b) and c)</li></ul>
<ul><li>3) Logic block of FPGA contains</li><li>a) Macrocell</li><li>c) Both a) and b)</li></ul>	<ul><li>b) Look-up table</li><li>d) None</li></ul>
<ul><li>4) Stuck-at 0 and stuck-at 1 faults cause</li><li>a) Short circuit fault</li><li>c) Short and open circuit fault</li></ul>	es due to b) Open circuit fault d) None
<ul><li>5) Logic within the functional block of CF</li><li>a) Product-of-some</li><li>c) Both a) and b)</li></ul>	PLD is implemented using b) Sum-of-product d) None
<ul><li>6) Macrocell of CPLD can implement</li><li>a) Combinatorial</li><li>c) Both a) and b)</li></ul>	function. b) Sequential/registered d) None
<ul><li>7) Boundary Scan technique consists of a) Scan path testing port</li></ul>	b) Test access port

d) None

8)	To detect N bit sequal a) 2 N	ence using Moore b) N + 1			
9)	A PLA has a a) Programmable A c) a) and b) both	,	b)	Programmable None of the abo	AND and OR
10)	The macrocell regis			l as D and T	
11)	Under steady state	condition power d	liss	ipated in CMOS	circuit is
	a) 0 W	b) 10 μW	c)	0.1 μ W	d) None
12)	The symbol a) := c) =>	is the signal	b)	signment operat <= None of above	or.
13)	Transmission Gate a) Pass Gate c) Fail Gate	in CMOS also cal	b)	as Pull – up gate Pull – down gat	e
14)	The block of code vinternal signal or va a) Architecture	ariable in VHDL		-	
15)	To implement 5 inp numbers of MOSFE	ut NOR gate using	-	_	
	a) 6	b) 8	c)	10	d) 4
16)	is not	a concurrent state	me	nt.	
	<ul><li>a) Generate</li><li>c) If – then</li></ul>		,	When else With – Select –	when
17)	The problem of a c a) Gates c) Combinational c		b)	Sequential circu	uit
18)	When an iterative a statement provides		-	•	
	a) Port map	b) For loop	c)	For Generate	d) None
19)	A process cannot ha) Wait statement c) Sensitivity list	ave	-	Wait statement None	and sensitivity list
20)	CLK'1 is an attribut a) EVENT	e type b) Delay	c)	Stable	d) None

Seat No.

# B.E. (E & TC) (Part – I) Examination, 2016 VLSI DESIGN

Day and Date: Thursday, 1-12-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **maximum** marks.

3) Assume suitable data if required.

SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- a) For CMOS inverter C = 50 fF, V = 3 V and F = 100 MHz calculate dynamic power consumed.
- b) What is pullup and pull down network in CMOS?
- c) What is Dataflow Modeling?
- d) Explain the concept of libraries.
- e) Write VHDL code for 3:8 decoder.

3. Solve **any three**:

- a) Implement the function using CMOS logic:
  - i)  $y = \overline{a + (b + c) (d + e)}$
  - ii)  $y = (ab + \overline{cd})e$ .
- b) Explain Operator overloading with example.
- c) Explain in detail VHDL Subprogram.
- d) Write VHDL code for 16: 1 multiplexer using structural modeling.

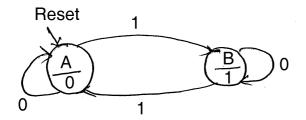


### SECTION - II

# 4. Solve any four:

 $(4 \times 4 = 16)$ 

a) Write a VHDL code given state diagram:



- b) Design J-K flipflop using state diagram.
- c) Write a short note on boundary scan.
- d) Write a test bench for 1 bit comparator.
- e) Compare CPLD and FPGA.

### 5. Solve any three:

- a) Explain in detail Macrocell.
- b) Explain in detail architecture of FPGA.
- c) Design state diagram and write VHDL code for coffee vending machine.
- d) Write a VHDL code for 2 × 2 multiplier using Add and Shift method.


	-	
Seat	Set	C
No.	Set	3

# B.E. (E & TC) (Part – I) Examination, 2016 **VLSI DESIGN**

Day and Date: Thursday, 1-12-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Figures to the **right** indicate **maximum** marks.
- 3) **Assume** suitable data **if required**.
- 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

			MC	Q/Objective T	ype	Questions		
Dura	tio	n : 30 Minutes		-				Marks: 20
1. (	Cho	oose the correct ans	swe	er:				(1×20=20)
	1)	a) Generate c) If – then	a c	oncurrent state	b)	nt. When else With – Select –	when	
	2)	The problem of a c a) Gates c) Combinational c			b)	Sequential circ	uit	
	3)	When an iterative a statement provides a) Port map	an	easy way of in	staı	-	mponents.	
	4)	A process cannot ha) Wait statement c) Sensitivity list	ave	e	•	Wait statement	t and sensit	ivity list
	5)	CLK'1 is an attribut a) EVENT	•	•	c)	Stable	d) None	
	6)	The behaviour of so a) State table	-			scribed in tabula State diagram		
	7)	Built in self test cor a) Shift register c) Compressor circ			,	Linear feedbac Both b) and c)	k shift regis	ter



8)	Logic block of FPGA contains		Look up toblo	
	<ul><li>a) Macrocell</li><li>c) Both a) and b)</li></ul>	,	Look-up table None	
9)	Stuck-at 0 and stuck-at 1 faul	lts causes o	due to	
	a) Short circuit fault	,	Open circuit fau	ult
	c) Short and open circuit faul	lt d)	None	
10)	Logic within the functional blo		•	_
	a) Product-of-some	•	Sum-of-product	
441	c) Both a) and b)	,	None	
11)	Macrocell of CPLD can impler <ul><li>a) Combinatorial</li></ul>		Sequential/regis	starad
	c) Both a) and b)	•	None	Siered
12)	Boundary Scan technique con	,		
,	a) Scan path testing port		Test access po	rt
	c) Both a) and b)	•	None	
13)	To detect N bit sequence using	g Moore ma	chine, the numbe	er of states required
	a) 2 N b) N + 1	c)	N – 1	d) 2 N – 1
14)	A PLA has a			
	a) programmable AND		programmable A	
	c) a) and b) both	•	none of the abo	
15)	The macrocell register can be	_		
4.0\			DandT	
16)	Under steady state condition a) 0 W b) 10 μ V	-	ipated in CMOS 0.1 μ W	
17)	The symbol is th	•		•
	a) :=			···
	c) =>	d)	None of above	
18)	Transmission Gate in CMOS	also called	as	
	a) Pass Gate	•	Pull – up gate	
4.0\	c) Fail Gate	,	Pull – down gate	
19)	The block of code which defir internal signal or variable in V		tionship betwee	n input, output and
	a) Architecture b) Entity		Package	d) Library
20)	To implement 5 input NOR ga	•	_	•
_5,	numbers of MOSFETs.	doing on	. C C logio loquil	
	a) 6 b) 8	c)	10	d) 4



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Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 VLSI DESIGN

-3-

Day and Date: Thursday, 1-12-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **maximum** marks.

3) Assume suitable data if required.

SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- a) For CMOS inverter C = 50 fF, V = 3 V and F = 100 MHz calculate dynamic power consumed.
- b) What is pullup and pull down network in CMOS?
- c) What is Dataflow Modeling?
- d) Explain the concept of libraries.
- e) Write VHDL code for 3:8 decoder.

3. Solve **any three**:

- a) Implement the function using CMOS logic:
  - i) y = a + (b + c) (d + e)
  - ii)  $y = (ab + \overline{cd})e$ .
- b) Explain Operator overloading with example.
- c) Explain in detail VHDL Subprogram.
- d) Write VHDL code for 16: 1 multiplexer using structural modeling.

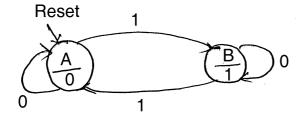


### SECTION - II

# 4. Solve any four:

 $(4 \times 4 = 16)$ 

a) Write a VHDL code given state diagram:



- b) Design J-K flipflop using state diagram.
- c) Write a short note on boundary scan.
- d) Write a test bench for 1 bit comparator.
- e) Compare CPLD and FPGA.

### 5. Solve any three:

- a) Explain in detail Macrocell.
- b) Explain in detail architecture of FPGA.
- c) Design state diagram and write VHDL code for coffee vending machine.
- d) Write a VHDL code for  $2 \times 2$  multiplier using Add and Shift method.


Seat		
No.	Set	P
		1 - 1

# B.E. (Electronics and Telecommunication) Part - I Examination, 2016 SATELLITE COMMUNICATION

Day and Date: Saturday, 3-12-2016	Max. Marks: 100
Time: 3.00 p.m. to 6.00 p.m.	

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

- 2) Figures to the **right** indicate **full** marks.
- 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries **one** mark.

		4)	_		ons on Page No. 3 only. 'Q/R/S) on Top of Page.
			MCQ/Objective	Type Questions	
Dura	atio	n : 30 Minutes			Marks : 20
1.	Ch	oose the correct a	ınswer :		(20×1=20)
	1)	is	based on a princip	le of trilateration.	
			b) GPS		d) VSAT
	2)		width of Communi	cation Satellite? c) 500 MHz	d) 1 – 2 GHz
	3)	The centrifugal for	orce acting on sate b) $m^2 \times (v/r)$	ellite, F <sub>OUT</sub> =	d) $m \times (v/r)$
	4)	<ul><li>a) Orbit of any s</li><li>b) Orbit of any s</li></ul>	maller body about e smaller body sw	on. a larger body is alw a larger body is alw reeps out equal area	vays a circular
	5)	The right ascens	ion of the ascendir	ng node is called	
		a) ω	b) Ω	c) i	<b>d)</b> μ
	6)	The satellite mov a) Ascending no c) Inclination		n the equatorial plar b) Descending r d) Right ascens	node
	7)	•	Meridian the line	, •	
	,	a) East to West		b) Equator	
		c) North to South	n Pole	d) None of the a	bove



8)	Latitude is the angua) North Pole c) Equator	ular distance meas	b)	d in degrees South Pole None of the		
9)	The Doppler shift is a) GEO		c)	LEO	d)	Polar Satellite
10)	Eclipse occurs duri equinoxes.	ing two period per	yea	ar, that is		days before
	a) 21	b) 22	c)	23	d)	24
	The gravitational pethe inclination of the a) 75° E					_
	a) 75° E	b) 105° W	c)	0.86°	d)	165° E
12)	At the equator there and 348° E.	e are bulges of abo			at lor	ngitudes 162° E
	a) 65 m		,	75 m	_	
	c) 55 m		•	None of the		
13)	In LEO satellite	is ha			rage are	ea.
	a) Equatorial		,	Inclined	_	
	c) Molniya		,	None of the	above	
14)	Apogee of the molr	-				
	a) 39152 km	•	•		d)	500 km
15)	Perigee of the molr	-				
	a) 39152 km	•	,	20200 km	d)	500 km
16)	Two molniya orbits					
	a) 90°	.,			,	360°
17)	Sun synchronous of	orbit maintains a co		_	th the c	lirection of
	a) Earth		,	Sun		
	c) Moon		,	Sub satellite	•	
18)	GPS space segme					
	a) 24	b) 22	c)	20	d)	18
19)	GPS satellite const	•			_	
	a) 60°	b) 30°	c)	120°	d)	180°
20)	In GPS which code	having high accui	racy	/?		
	a) C/A		b)		_	
	c) Both a) and b)		d)	None of the	above	



Seat	
No.	

# B.E. (Electronics and Telecommunication) Part – I Examination, 2016 SATELLITE COMMUNICATION

Day and Date: Saturday, 3-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks.

SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) What is latitude, longitude and sub satellite point?
- 2) Explain the procedure for locating the satellite in the orbit.
- 3) Discuss Kepler's three laws of planetary motion.
- 4) Describe Attitude and Orbit Control System (AOCS).
- 5) A satellite at a distance of 40000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point and the power received by an antenna at this point with an effective area of 10 m<sup>2</sup>.

### 3. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Develop the equation of orbit.
- 2) Describe in detail inclination changes effects of the Sun and Moon.
- 3) Write a short note on satellite subsystems.
- 4) Explain calculation of system noise temperature.

#### SECTION - II

## 4. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) Explain in detail molniva orbit.
- 2) What is Sun synchronous orbit? What are its applications?
- 3) Describe delay and through put considerations.
- 4) Write a short note on incremental growth and interim operations of satellite.
- 5) Explain types of earth stations.

#### 5. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Write a short note on equatorial orbits, inclined orbits and elliptical orbits.
- 2) Explain frequency band considerations in LEO satellites.
- 3) Describe elevation angle considerations in LEO satellites.
- 4) What are earth station design considerations?

Set P


Seat		
No.	Set	$ \mathbf{Q} $
		_

B.E.	(Electronics		unication) Part		on, 2016
-	d Date : Saturd 3.00 p.m. to 6.	•		Max. I	Marks : 100
	Instructions :	3) Q. No. 1 is co 30 minutes in carries one ma 4) Answer MCQ/C	<b>ight</b> indicate <b>full</b> m <b>ompulsory</b> . It sho Answer Book Page	ould be solved i e No. <b>3. Each</b> q s <b>tions on Page N</b>	uestion l <b>o. 3 only.</b>
Duratio	n : 30 Minutes	MCQ/Objecti	ve Type Questions	5	Marks : 20
	oose the corre Two molniya o	ct answer : orbits plans separa	ted by		(20×1=20)
,	a) 90°	b) 180°	_	d) 360°	
2)	Sun synchron a) Earth c) Moon	ous orbit maintains	s a constant angle v b) Sun d) Sub satelli		of
3)	GPS space se	egment consist of _	satellite	es in MEO.	
	a) 24	,	c) 20	d) 18	
4)	GPS satellite (a) 60°	constellation separa b) 30°	ated by c) 120°	_ in longitude. d) 180°	
5)	In GPS which a) C/A c) Both a) and	code having high a	accuracy ? b) P d) None of the	e above	
6)		-	ciple of trilateration.		
	a) Teledesic	b) GPS	c) Iridium	d) VSAT	
7)	What is the bata) $8 - 16 \text{ GHz}$		ınication Satellite? z c) 500 MHz	d) 1 – 2 Gł	Нz

8) The centrifugal force acting on satellite,  $F_{OUT} =$  a)  $m \times (v^2/r)$  b)  $m^2 \times (v/r)$  c)  $m \times (v/r^2)$ 

d)  $m \times (v/r)$ 

9)	Kepler's first law of	-				
	a) Orbit of any small	_		-	-	-
	b) Orbit of any small	-	-		-	
	c) The orbit of the	smaller body swee	eps	out equal area	ın ed	qual time
	d) None of above					
10)	The right ascension	_				
	<b>a</b> ) ω	b) Ω			d)	
11)	The satellite moves			•		he
	a) Ascending node	•	p)	Descending no		
	c) Inclination		,	Right ascension	n	
12)	At the Greenwich N					
	<ul><li>a) East to West</li><li>c) North to South F</li></ul>		b)	Equator		
				None of the ab		
13)	Latitude is the angu	ılar distance meas		_	rm	
	a) North Pole		,	South Pole		
	c) Equator		d)	None of the ab	ove	
14)	The Doppler shift is			. = 0		D 1 0 . III.
\	a) GEO					
15)	Eclipse occurs dur	ing two period per	yea	ar, that is		days before
	equinoxes.	1.) 00		00		0.4
	a) 21	b) 22				
16)	The gravitational p					ends to change
	the inclination of th	e satellite's orbit _	- \	per yea	ar.	1050 <b>5</b>
\	a) 75° E					
17)	At the equator ther	e are bulges of ab	out	6	at Ioi	ngitudes 162° E
	and 348° E.		I۵۱	75		
	a) 65 m		,	75 m		
40\	c) 55 m			None of the ab		
18)	In LEO satellite	ıs na			e ar	ea.
	a) Equatorial		,	Inclined	01/0	
40\	c) Molniya		,	None of the ab	ove	
19)	Apogee of the molr	-			-1\	500 lara-
00)	a) 39152 km	b) 35786 km	,	20200 km	a)	500 km
20)	Perigee of the molr	-			. 1\	500 lara-
	a) 39152 km	b) 35786 km	C)	20200 km	d)	500 km

Set Q



Seat	
No.	

# B.E. (Electronics and Telecommunication) Part – I Examination, 2016 SATELLITE COMMUNICATION

Day and Date: Saturday, 3-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) What is latitude, longitude and sub satellite point?
- 2) Explain the procedure for locating the satellite in the orbit.
- 3) Discuss Kepler's three laws of planetary motion.
- 4) Describe Attitude and Orbit Control System (AOCS).
- 5) A satellite at a distance of 40000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point and the power received by an antenna at this point with an effective area of 10 m<sup>2</sup>.

#### 3. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Develop the equation of orbit.
- 2) Describe in detail inclination changes effects of the Sun and Moon.
- 3) Write a short note on satellite subsystems.
- 4) Explain calculation of system noise temperature.

#### SECTION - II

### 4. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) Explain in detail molniva orbit.
- 2) What is Sun synchronous orbit? What are its applications?
- 3) Describe delay and through put considerations.
- 4) Write a short note on incremental growth and interim operations of satellite.
- 5) Explain types of earth stations.

#### 5. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Write a short note on equatorial orbits, inclined orbits and elliptical orbits.
- 2) Explain frequency band considerations in LEO satellites.
- 3) Describe elevation angle considerations in LEO satellites.
- 4) What are earth station design considerations?

Set Q

Seat		
No.	Set	R
		••

# B.E. (Electronics and Telecommunication) Part – I Examination, 2016 SATELLITE COMMUNICATION

Day and Date: Saturday, 3-12-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Figures to the right indicate full marks.
- 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

		Don't	forget to m	entior	n, Q.P. Set (	P/Q/R/S	on Top	of Page.
		МС	Q/Objective	е Туре	Questions	}		
Dura	tion: 30 Minutes		•					Marks: 20
1. (	Choose the correc	t answe	r:					(20×1=20)
	<ol> <li>The gravitation the inclination</li> </ol>						ends to	change
	the inclination a) 75° E	b)	105° W	c)	0.86°	d)	165° E	
;	2) At the equator and 348° E.	there are	e bulges of a	about .		at lor	ngitudes	162° E
	a) 65 m			b)	75 m			
	c) 55 m			d)	None of the	above		
;	<ul><li>3) In LEO satellite</li><li>a) Equatorial</li><li>c) Molniya</li></ul>	e	is	b)	g large cove Inclined None of the		ea.	
	4) Apogee of the a) 39152 km	-				d)	500 km	
;	5) Perigee of the a) 39152 km	molniya	satellite at a	an altit	ude of	,		
(	6) Two molniya o a) 90°	•	ns separate 180°	-	0°	d)	360°	
	7) Sun synchrono a) Earth c) Moon	ous orbit	maintains a	b)	ant angle w Sun Sub satellit		lirection	of

8)	GPS space segme	nt consist of		ites in ME	O.
	a) 24	b) 22	c) 20	d)	18
9)	GPS satellite const	ellation separated	by	in long	itude.
	a) 60°	b) 30°	c) 120°	d)	180°
10)	In GPS which code	having high accur	acy?		
	a) C/A		b) P		
	c) Both a) and b)		d) None of t	the above	
11)	is ba	sed on a principle	of trilateratio	n.	
	a) Teledesic	b) GPS	c) Iridium	d)	VSAT
12)	What is the bandwi	dth of Communica	tion Satellite	?	
	a) 8 – 16 GHz	b) 4 – 6 GHz	c) 500 MHz	d)	1 – 2 GHz
13)	The centrifugal force	e acting on satelli	te, F <sub>OUT</sub> =		
	a) $m \times (v^2/r)$	b) $m^2 \times (v/r)$	c) $m \times (v/r^2)$	$\frac{2}{2}$ ) d)	$m \times (v/r)$
14)	Kepler's first law of	planetary motion.			
	a) Orbit of any sma	aller body about a	larger body is	s always a	an ellipse
	b) Orbit of any sma	•	•	-	
	c) The orbit of the	smaller body swee	ps out equal	area in e	qual time
	d) None of above				
15)	The right ascension	n of the ascending	node is calle	d	
	a) ω	b) Ω	c) i	,	μ
16)	The satellite moves		-	-	he
	a) Ascending node		b) Descend	•	
	c) Inclination		d) Right aso		
17)	At the Greenwich M	leridian the line dra		<b>;</b>	
	a) East to West	<b>.</b> .	b) Equator		
4.0\	c) North to South F		d) None of t		
18)	Latitude is the angu	ılar distance meas			
	a) North Pole		b) South Po		
40)	c) Equator	P 71 6	d) None of t	ine above	
19)	The Doppler shift is		a) 150	.۱۱	Dalay Oatalita
00/	a) GEO	b) MEO	,	•	Polar Satellite
20)	Eclipse occurs duri	ing two period per	year, that is		days before
	equinoxes.	h) 22	0) 33	۸۱	24
	a) 21	b) 22	c) 23	u)	24



Seat	
No.	

# B.E. (Electronics and Telecommunication) Part – I Examination, 2016 SATELLITE COMMUNICATION

Day and Date: Saturday, 3-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks.

#### SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) What is latitude, longitude and sub satellite point?
- 2) Explain the procedure for locating the satellite in the orbit.
- 3) Discuss Kepler's three laws of planetary motion.
- 4) Describe Attitude and Orbit Control System (AOCS).
- 5) A satellite at a distance of 40000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point and the power received by an antenna at this point with an effective area of 10 m<sup>2</sup>.

#### 3. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Develop the equation of orbit.
- 2) Describe in detail inclination changes effects of the Sun and Moon.
- 3) Write a short note on satellite subsystems.
- 4) Explain calculation of system noise temperature.

#### SECTION - II

### 4. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) Explain in detail molniva orbit.
- 2) What is Sun synchronous orbit? What are its applications?
- 3) Describe delay and through put considerations.
- 4) Write a short note on incremental growth and interim operations of satellite.
- 5) Explain types of earth stations.

#### 5. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Write a short note on equatorial orbits, inclined orbits and elliptical orbits.
- 2) Explain frequency band considerations in LEO satellites.
- 3) Describe elevation angle considerations in LEO satellites.
- 4) What are earth station design considerations?

Set R

# **SLR-EP - 150**

Seat		
No.	Set	S

•	nication) Part – I Examination, 2016 OMMUNICATION
Day and Date : Saturday, 3-12-2016 Time : 3.00 p.m. to 6.00 p.m.	Max. Marks : 100
3) Q. No. <b>1</b> is <b>con</b> <b>30 minutes</b> in Ar carries <b>one</b> mark. 4) <b>Answer MCQ/Ob</b>	tht indicate full marks.  Inpulsory. It should be solved in first nswer Book Page No. 3. Each question
	e Type Questions
Duration: 30 Minutes	Marks : 20
1. Choose the correct answer:	(20×1=20)
<ol> <li>The satellite moves upward through a) Ascending node</li> <li>Inclination</li> <li>At the Greenwich Meridian the line</li> <li>East to West</li> <li>North to South Pole</li> <li>Latitude is the angular distance me</li> <li>North Pole</li> </ol>	b) Descending node d) Right ascension drawn from the b) Equator d) None of the above easured in degrees form b) South Pole
<ul><li>c) Equator</li><li>4) The Doppler shift is negligible for</li></ul>	d) None of the above
<ul><li>a) GEO</li><li>b) MEO</li><li>5) Eclipse occurs during two period p equinoxes.</li></ul>	c) LEO d) Polar Satellite per year, that is days before
<ul> <li>a) 21</li> <li>b) 22</li> <li>6) The gravitational pull on the satellit the inclination of the satellite's orbit</li> <li>a) 75° E</li> <li>b) 105° W</li> </ul>	c) 23 d) 24 te due to Sun and Moon tends to change t per year. c) 0.86° d) 165° E
,	about at longitudes 162° E  b) 75 m d) None of the above

8)	In LEO satellite a) Equatorial c) Molniya	is ha	ving large coverage b) Inclined d) None of the abo	
9)	Apogee of the molr a) 39152 km		altitude of c) 20200 km	d) 500 km
10)	Perigee of the molr a) 39152 km	-	altitude of c) 20200 km	d) 500 km
11)	Two molniya orbits a) 90°	-		d) 360°
12)	Sun synchronous c a) Earth c) Moon	orbit maintains a co	onstant angle with the book Sun and Sub satellite po	
13)	GPS space segmental 24	nt consist of b) 22	•	
	GPS satellite constant a) 60°		by in lo	ongitude.
15)	In GPS which code a) C/A c) Both a) and b)	•	•	·
16)	is ba	sed on a principle	•	,,,,
.0,	a) Teledesic			d) VSAT
17)	What is the bandwine a) 8 – 16 GHz	dth of Communica	tion Satellite?	d) 1 – 2 GHz
18)	The centrifugal force	e acting on satelli	•	,
	<ul><li>b) Orbit of any sma</li><li>c) The orbit of the s</li><li>d) None of above</li></ul>	aller body about a aller body about a smaller body swee	larger body is alway larger body is alwa eps out equal area in	ys a circular
(۷	The right ascension a) ω	b) Ω	c) i	<b>d)</b> μ



Seat	
No.	

# B.E. (Electronics and Telecommunication) Part – I Examination, 2016 SATELLITE COMMUNICATION

Day and Date: Saturday, 3-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks.

SECTION-I

2. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) What is latitude, longitude and sub satellite point?
- 2) Explain the procedure for locating the satellite in the orbit.
- 3) Discuss Kepler's three laws of planetary motion.
- 4) Describe Attitude and Orbit Control System (AOCS).
- 5) A satellite at a distance of 40000 km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17 dB in the direction of the observer. Find the flux density at the receiving point and the power received by an antenna at this point with an effective area of 10 m<sup>2</sup>.

### 3. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Develop the equation of orbit.
- 2) Describe in detail inclination changes effects of the Sun and Moon.
- 3) Write a short note on satellite subsystems.
- 4) Explain calculation of system noise temperature.

#### SECTION - II

## 4. Solve any four:

 $(4 \times 4 = 16)$ 

- 1) Explain in detail molniva orbit.
- 2) What is Sun synchronous orbit? What are its applications?
- 3) Describe delay and through put considerations.
- 4) Write a short note on incremental growth and interim operations of satellite.
- 5) Explain types of earth stations.

#### 5. Solve any three:

 $(3 \times 8 = 24)$ 

- 1) Write a short note on equatorial orbits, inclined orbits and elliptical orbits.
- 2) Explain frequency band considerations in LEO satellites.
- 3) Describe elevation angle considerations in LEO satellites.
- 4) What are earth station design considerations?

Set S

Seat No.		Set	P
	B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY		

Day and Date : Tuesday, 6-12-2016 Time : 3.00 p.m. to 6.00 p.m. Max. Marks: 100

	in 3) <b>A</b> l	. No. <b>1</b> is <b>compulso</b> Answer Book Page <b>nswer MCQ/Objec</b>	ry. It should be solve No. 3. Each questions tive type questions tion, Q.P. Set (P/Q/F	ed in <b>first 30 minutes</b> on carries <b>one</b> mark. <b>s on Page No. 3 only.</b> R/S) on Top of Page.	
Duration	n : 30 Minutes		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Marks : 20	)
1. Ch	oose the correct ansv	ver:		20	)
1)	For a code rate 2/3, code are a) 2 c) data is insufficier		state in state diagrab) 4 d) none of these	ım of convolutional	
2)	Free distance of nor of systematic convol a) More	•		d) None of these	
3)	No. of disjoint cells r a) $2^{k-1}$	equired to implement b) 2 <sup>k-2</sup>	nt decoder for convo c) 2 <sup>k</sup>	olutional codes are d) None of these	
4)	The exponent of D in a) Free distance c) No. of decoded z	_	ives b) No. of decoded of the pa		
5)	The parity check ma a) $n \times k$	trix of (n, k) block cob) $k \times n$	ode is of the order of c) $(n-k) \times n$	d) $k \times (n-k)$	
6)	Generator matrix is tage a) Encoding c) Standard array	used for	<ul><li>b) Decoding</li><li>d) None of these</li></ul>		
7)	In a standard array ra) 5	number of coset lead b) 2	ders in (5, 2) code ar c) 3	re d) 8	
8)	Check which of the a) (7, 4)	following is Hammin b) (7, 3)	ng code. c) (6, 3)	d) (8, 2)	
9)	For a generator poly a) (7, 4)	nomial $g(x) = 1 + x + b$ b) (8, 5)	x <sup>3</sup> . The cyclic code c) (7, 3)	for this polynomial is d) (6, 3)	



10)	If a valid codeword is also a valid code a) 0000	in non-systematic cy word ? b) 1011		code is 1101. W		n of the following
11)	A turbo code  a) is concatenated c) uses iterating de	code	b)	uses interleaver	u,	1001
12)	,	nvolutional encoder i	s	Both	d)	None of these
13)	,	ode, g <sub>1</sub> = 111 and g <sub>2</sub>	,		,	
	a) 1/2, 3	b) 1/3, 2	c)	1/2, 2	d)	1/3, 3
14)	The total area unde	r probability distribu	tion b)			
	c) depends on dist	ribution	d)	none of these		
15)	Let A and B be two	events. If $P(A) = \frac{3}{4}$ , F	P(B)	$=\frac{1}{2}$ , $P(A \cup B) = \frac{1}{2}$	1 ar	$nd P(A \cap B) = \frac{1}{4},$
	then the conditional	probability of B give	en A	\ is		
	a) $\frac{1}{3}$	b) $\frac{3}{4}$	c)	$\frac{1}{2}$	d)	$\frac{1}{4}$
16)		ie are rolled and the umber greater than			ed. ∃	The probability of
	a) $\frac{1}{6}$	b) $\frac{2}{9}$	c)	$\frac{1}{9}$	d)	<del>1</del> 18
17)	Find the constant C	so that				
	f(x) = C(x-2) for	1 < x < 4				
	= 0 oth	erwise				
	a) 1	b) 2	c)	1/4	d)	1/2
18)		is added to rec b) Error pattern				
19)	In block coding, if k a) 13	= 5 and n = 8, we had b) 32		4096		tuples. 64
20)	Viterbi decoding alg	orithm can be imple	me	nted using		computation.
-	a) Add-compare-select			b) Compare-add-select		
	c) Add-select-com	oare	d)	Compare-select-	-ado	d
				<del></del>		

Seat No.

# B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY

Day and Date: Tuesday, 6-12-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data of necessary.

#### SECTION - I

# 2. A) Attempt any two:

12

Marks: 80

- a) A newly constructed flyover is likely to collapse. The chance that design is faulty is 0.5. The chance that flyover will collapse if the design is faulty is 0.95 otherwise it is 0.30. The flyover collapsed. What is the probability that flyover will collapse because of faulty design?
- b) For (7, 4) cyclic code, check whether given generator polynomial  $g(x) = 1 + x^2 + x^3$  generates cyclic code or not.
- c) The generator matrix of (6, 3) systematic block code is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Find decoding table.

B) For (7, 3) block code for a given parity matrix

$$P = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

- i) What is the generator matrix for this code?
- ii) Find all the code words.
- iii) What will be the error-correcting capability?
- iv) What will be the error-detecting capability?



### 3. A) Attempt any two:

8

- a) The generator polynomial for (15, 7) cyclic code is  $g(x) = 1 + x^4 + x^6 + x^7 + x^8$ . Find the code vector for message polynomial  $m(x) = x^2 + x^3 + x^4$  using systematic method.
- b) How error detection and correction is done in cyclic code? Explain it.
- c) State and prove Bayes theorem.
- B) a) Find the value of k such that following will be probability density function.

$$f_x(x) = k.x$$
  $0 \le x \le 1$   
= k  $1 \le x \le 2$   
= k(3-x)  $2 \le x \le 3$ 

Also find  $P(x \le 1.5)$ .

8

- b) A card is drawn at random from an ordinary deck of 52 playing cards. Find the probability of being:
- 4

- i) an ace
- ii) a six or a heart.

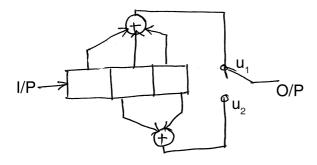
#### SECTION - II

# 4. A) Attempt any three:

- a) Explain maximum likelihood algorithm used in convolutional codes.
- b) For convolutional encoder, whose generator sequences are  $g_1 = 111$ ,  $g_2 = 101$ :
  - i) Draw state diagram representing starting state and ending state separately.
  - ii) Write state equations.
- c) Define:
  - i) Coding gain
  - ii) Catastrophic error propagation.
- d) Explain in brief Turbo encoder.



B) For the given convolutional encoder.



- i) Draw encoder trellis diagram.
- ii) Find transfer function.

## 5. A) Attempt any two:

10

- a) Explain principle of iterative Turbo decoding.
- b) Explain soft decision Viterbi decoding.
- c) Explain how impulse response can be used to find encoded sequence of convolutional encoder.
- B) For a convolutional encoder rate =  $\frac{1}{2}$ , generator sequences are  $g_1 = 111$  and  $g_2 = 101$ :
  - i) Draw encoder trellis diagram.
  - ii) Draw decoder trellis diagram.
  - iii) Find encoded output for input message 1010 from trellis diagram.

# SI R-FP - 151

				OLI I-LI	101
Seat No.				Set	Q
	E		art – I) Examination, ING THEORY	2016	
•	d Date : Tuesda 3.00 p.m. to 6.00	•		Max. Marks	: 100
	Instructions :	in Answer Book 3) Answer MCQ/	re compulsory. pulsory. It should be so reage No. 3. Each que Objective type question mention, Q.P. Set (P/	estion carries <b>one</b> mark <b>ons on Page No. 3 or</b>	α. 1 <b>1y.</b>
		MCQ/Objec	tive Type Questions		
Duration	n : 30 Minutes			Mark	s:20
1. Ch	oose the correc	t answer :			20
1)		ded die are rolled ar ven number greate	nd the face values are a r than 9 is	dded. The probability o	f
	a) $\frac{1}{6}$	b) $\frac{2}{9}$	c) $\frac{1}{9}$	d) $\frac{1}{18}$	
2)	Find the consta	ant C so that			
	f(x) = C(x-2)	for $1 < x < 4$			
	= 0	otherwise			
	a) 1	b) 2	c) 1/4	d) 1/2	
3)			to received vector to ob ern c) a) or b)		
4)	In block coding a) 13	g, if k = 5 and n = 8, b) 32	we have c) 4096	k tuples. d) 64	
5)	Viterbi decodir a) Add-compa c) Add-select	are-select	implemented using b) Compare-add d) Compare-sel	d-select	. <b>.</b>
6)	For a code rate code are a) 2 c) data is insu		n each state in state dia b) 4 d) none of these		
7)			convolutional code is for same code rate. c) Equal	than tha	.t



8)	No. of disjoint cells r a) $2^{k-1}$	required to impleme b) 2 <sup>k-2</sup>		lecoder for convo 2 <sup>k</sup>		onal codes are None of these
9)	The exponent of D in a) Free distance c) No. of decoded z		b)	No. of decoded Length of the pa		bit
10)	The parity check ma a) $n \times k$	trix of (n, k) block cob) $k \times n$		is of the order of $(n-k) \times n$	d)	$k \times (n-k)$
11)	Generator matrix is an an encoding c) Standard array	used for	,	Decoding None of these		
12)	In a standard array ra) 5	number of coset lead b) 2	ders c)	• •	e d)	
13)	Check which of the tall (7, 4)	following is Hammir b) (7,3)	_		d)	(8, 2)
14)	For a generator poly a) $(7,4)$	nomial $g(x) = 1 + x + b)$ (8, 5)				his polynomial is (6, 3)
15)	If a valid codeword i is also a valid codev a) 0000	•		code is 1101. W		n of the following
16)	<ul><li>A turbo code</li><li>a) is concatenated</li><li>c) uses iterating de</li></ul>		,	uses interleaver all of these		
17)	Non-systematic con a) FIR system			Both	d)	None of these
18)	For convolutional collength of this encode a) 1/2, 3					nd constraint
19)	The total area under a) 0 c) depends on distr	probability distribut	ion b)	curve is	ŕ	
20)	Let A and B be two	events. If $P(A) = \frac{3}{4}$ , F	P(B)	$=\frac{1}{2}$ , $P(A \cup B) =$	1 ar	$nd P(A \cap B) = \frac{1}{4},$
	then the conditional	probability of B give	n A	A is		
	a) $\frac{1}{3}$	b) $\frac{3}{4}$	c)	$\frac{1}{2}$	d)	1/4

Seat No.

# B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY

Day and Date: Tuesday, 6-12-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data of necessary.

#### SECTION - I

# 2. A) Attempt any two:

12

Marks: 80

- a) A newly constructed flyover is likely to collapse. The chance that design is faulty is 0.5. The chance that flyover will collapse if the design is faulty is 0.95 otherwise it is 0.30. The flyover collapsed. What is the probability that flyover will collapse because of faulty design?
- b) For (7, 4) cyclic code, check whether given generator polynomial  $g(x) = 1 + x^2 + x^3$  generates cyclic code or not.
- c) The generator matrix of (6, 3) systematic block code is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Find decoding table.

B) For (7, 3) block code for a given parity matrix

$$P = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

- i) What is the generator matrix for this code?
- ii) Find all the code words.
- iii) What will be the error-correcting capability?
- iv) What will be the error-detecting capability?



# 3. A) Attempt any two:

8

- a) The generator polynomial for (15, 7) cyclic code is  $g(x) = 1 + x^4 + x^6 + x^7 + x^8$ . Find the code vector for message polynomial  $m(x) = x^2 + x^3 + x^4$  using systematic method.
- b) How error detection and correction is done in cyclic code? Explain it.
- c) State and prove Bayes theorem.
- B) a) Find the value of k such that following will be probability density function.

$$f_x(x) = k.x$$
  $0 \le x \le 1$   
= k  $1 \le x \le 2$   
= k(3-x)  $2 \le x \le 3$ 

Also find  $P(x \le 1.5)$ .

8

4

- b) A card is drawn at random from an ordinary deck of 52 playing cards. Find the probability of being:
  - i) an ace
  - ii) a six or a heart.

#### SECTION - II

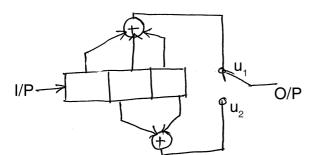
# 4. A) Attempt any three:

- a) Explain maximum likelihood algorithm used in convolutional codes.
- b) For convolutional encoder, whose generator sequences are  $g_1 = 111$ ,  $g_2 = 101$ :
  - i) Draw state diagram representing starting state and ending state separately.
  - ii) Write state equations.
- c) Define:
  - i) Coding gain
  - ii) Catastrophic error propagation.
- d) Explain in brief Turbo encoder.

8



B) For the given convolutional encoder.



- i) Draw encoder trellis diagram.
- ii) Find transfer function.

### 5. A) Attempt any two:

- a) Explain principle of iterative Turbo decoding.
- b) Explain soft decision Viterbi decoding.
- c) Explain how impulse response can be used to find encoded sequence of convolutional encoder.
- B) For a convolutional encoder rate =  $\frac{1}{2}$ , generator sequences are  $g_1 = 111$  and  $g_2 = 101$ :
  - i) Draw encoder trellis diagram.
  - ii) Draw decoder trellis diagram.
  - iii) Find encoded output for input message 1010 from trellis diagram.


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No.	Set	ח

# B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY

		CODING	HE	ORY		
•	d Date : Tuesday, 6- <sup>-</sup> .00 p.m. to 6.00 p.m.					Max. Marks: 100
	ir 3) <b>A</b>	II questions are con D. No. 1 is compulson Answer Book Page Answer MCQ/Object Oon't forget to men	ory. e No etive	It should be solve b. <b>3. Each</b> questions <b>e type questions</b>	on c <b>on</b>	arries <b>one</b> mark. <b>Page No. 3 only.</b>
		MCQ/Objective T	уре	Questions		
Duration	n : 30 Minutes					Marks: 20
1. Cho	oose the correct ans	wer:				20
1)	A turbo code a) is concatenated c) uses iterating de		,	uses interleaver all of these		
2)	Non-systematic cor a) FIR system			Both	d)	None of these
3)	For convolutional collength of this encod a) 1/2, 3		_			nd constraint
4)	The total area unde a) 0 b) 1 c) depends on dist d) none of these		tion	curve is	,	
5)	5) Let A and B be two events. If $P(A) = \frac{3}{4}$ , $P(B) = \frac{1}{2}$ , $P(A \cup B) = 1$ and $P(A \cap B) = \frac{1}{4}$ ,					$nd P(A \cap B) = \frac{1}{4},$
	then the conditional	probability of B give	en A	A is		
	a) $\frac{1}{3}$	b) $\frac{3}{4}$	c)	$\frac{1}{2}$	d)	$\frac{1}{4}$
6)	Two fair six-sided di obtaining an even n				ed. T	he probability of
	a) $\frac{1}{6}$	b) $\frac{2}{9}$	c)	19	d)	1 18

7)	Find the constant C	so that				
	f(x) = C(x-2)  for  1	< x < 4				
	= 0 oth	erwise				
	a) 1	b) 2	c)	1/4	d)	1/2
8)	Calculateda) Syndrome					
9)	In block coding, if k	= 5 and n = 8, we ha	ave		_ k	tuples.
	a) 13	b) 32	c)		d)	64
10)	Viterbi decoding alg a) Add-compare-se c) Add-select-comp	lect	b)	nted using Compare-add-se Compare-select	elec	et .
11)	For a code rate 2/3, code are	transition from each		_	m c	of convolutional
	<ul><li>a) 2</li><li>c) data is insufficier</li></ul>	nt	q)	none of these		
12)	Free distance of nor		,			than that
,	of systematic convol	•	ne c			
13)	No. of disjoint cells r a) $2^{k-1}$	,	nt d	•	lutio	
14)	The exponent of D in a) Free distance c) No. of decoded z	•	b)	No. of decoded		bit
15)	The parity check ma	trix of (n, k) block co	ode	is of the order of		
,	a) n×k	b) k×n		$(n-k) \times n$	d)	$k \times (n-k)$
16)	Generator matrix is an an an an an an an array	used for		Decoding None of these		
17)	In a standard array ra) 5	number of coset lead b) 2	ders c)	` '	e d)	
18)	Check which of the a) (7, 4)	following is Hammir b) (7,3)	•		d)	(8, 2)
19)	For a generator poly a) (7, 4)	rnomial $g(x) = 1 + x + b$ b) (8, 5)		The cyclic code (7, 3)		this polynomial is (6, 3)
20)	If a valid codeword i is also a valid codew		/clic	code is 1101. W	'hicl	h of the following
	a) 0000	b) 1011	c)	0110	d)	1001

Seat No.

# B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY

Day and Date: Tuesday, 6-12-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data of necessary.

#### SECTION - I

# 2. A) Attempt any two:

12

Marks: 80

- a) A newly constructed flyover is likely to collapse. The chance that design is faulty is 0.5. The chance that flyover will collapse if the design is faulty is 0.95 otherwise it is 0.30. The flyover collapsed. What is the probability that flyover will collapse because of faulty design?
- b) For (7, 4) cyclic code, check whether given generator polynomial  $g(x) = 1 + x^2 + x^3$  generates cyclic code or not.
- c) The generator matrix of (6, 3) systematic block code is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Find decoding table.

B) For (7, 3) block code for a given parity matrix

8

$$P = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

- i) What is the generator matrix for this code?
- ii) Find all the code words.
- iii) What will be the error-correcting capability?
- iv) What will be the error-detecting capability?

Set R



### 3. A) Attempt any two:

8

- a) The generator polynomial for (15, 7) cyclic code is  $g(x) = 1 + x^4 + x^6 + x^7 + x^8$ . Find the code vector for message polynomial  $m(x) = x^2 + x^3 + x^4$  using systematic method.
- b) How error detection and correction is done in cyclic code? Explain it.
- c) State and prove Bayes theorem.
- B) a) Find the value of k such that following will be probability density function.

$$f_x(x) = k.x$$
  $0 \le x \le 1$   
= k  $1 \le x \le 2$   
= k(3-x)  $2 \le x \le 3$ 

Also find  $P(x \le 1.5)$ .

8

- b) A card is drawn at random from an ordinary deck of 52 playing cards. Find the probability of being:
- 4

- i) an ace
- ii) a six or a heart.

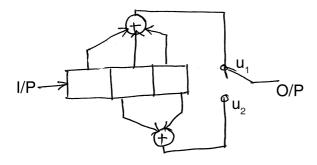
## SECTION - II

# 4. A) Attempt any three:

- a) Explain maximum likelihood algorithm used in convolutional codes.
- b) For convolutional encoder, whose generator sequences are  $g_1 = 111$ ,  $g_2 = 101$ :
  - i) Draw state diagram representing starting state and ending state separately.
  - ii) Write state equations.
- c) Define:
  - i) Coding gain
  - ii) Catastrophic error propagation.
- d) Explain in brief Turbo encoder.



B) For the given convolutional encoder.



- i) Draw encoder trellis diagram.
- ii) Find transfer function.

### 5. A) Attempt any two:

10

- a) Explain principle of iterative Turbo decoding.
- b) Explain soft decision Viterbi decoding.
- c) Explain how impulse response can be used to find encoded sequence of convolutional encoder.
- B) For a convolutional encoder rate =  $\frac{1}{2}$ , generator sequences are  $g_1 = 111$  and  $g_2 = 101$ :
  - i) Draw encoder trellis diagram.
  - ii) Draw decoder trellis diagram.
  - iii) Find encoded output for input message 1010 from trellis diagram.

Seat No.	Set	S
	<u>.                                      </u>	

# B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY

	CODIN	NG THEORY		
Day and Date: Tue Time: 3.00 p.m. to	•		Max. Ma	arks : 100
Instructio	in Answer Book 1 3) <b>Answer MCQ/O</b>	e compulsory. vulsory. It should be so Page No. 3. Each que bjective type question mention, Q.P. Set (P/	estion carries <b>one</b> n <b>ons on Page No.</b> 3	nark. <b>3 only.</b>
	MCQ/Objecti	ve Type Questions		
Duration: 30 Minut	es		N	/larks : 20
1. Choose the co	rrect answer :			20
1) Generator a) Encodi c) Standa	•	b) Decoding d) None of thes	e	
2) In a standa a) 5	ard array number of cose b) 2	t leaders in (5, 2) code c) 3	e are d) 8	_
3) Check whi a) (7, 4)	ch of the following is Hai b) (7,3)	mming code. c) (6, 3)	d) (8, 2)	
4) For a gene a) (7, 4)	erator polynomial $g(x) = 1$ b) $(8, 5)$	+ $x + x^3$ . The cyclic co c) (7, 3)	de for this polynom d) (6, 3)	ial is
•	odeword in non-systema alid codeword ? b) 1011	tic cyclic code is 1101 c) 0110	. Which of the follogon d) 1001	wing
6) A turbo cod a) is conc	•	b) uses interlea d) all of these	,	
7) Non-syster a) FIR sys	matic convolutional enco stem b) IIR system		d) None of the	ese
length of th	utional code, g <sub>1</sub> = 111 ar nis encoder is	_		t
a) 0	b) 1/3, 2 rea under probability dis Is on distribution	,	d) 1/3,3 e	



10)	Let A and B be	two events. If $P(A) = \frac{3}{4}$	$P(B) = \frac{1}{2}, P(A \cup B)$	$= 1 \text{ and } P(A \cap B) = \frac{1}{4},$
		tional probability of B given		·
	a) $\frac{1}{3}$	b) $\frac{3}{4}$	c) $\frac{1}{2}$	d) $\frac{1}{4}$
11)		led die are rolled and the ven number greater thar		dded. The probability of
	a) $\frac{1}{6}$	b) $\frac{2}{9}$	c) $\frac{1}{9}$	d) $\frac{1}{18}$
12)	Find the consta	ant C so that		
	f(x) = C(x-2)	for 1 < x < 4		
	= 0	otherwise		
	a) 1	b) 2	c) 1/4	d) 1/2
13)		is added to re b) Error pattern		
14)	In block coding a) 13	g, if k = 5 and n = 8, we h b) 32	nave c) 4096	k tuples. d) 64
15)	Viterbi decodin a) Add-compa c) Add-select-		_	d-select
16)	code are	e 2/3, transition from eac		gram of convolutional
	<ul><li>a) 2</li><li>c) data is insu</li></ul>	fficient	b) 4 d) none of these	9
17)	Free distance	of non-systematic convo	olutional code is	
	a) More	b) Less	c) Equal	d) None of these
18)	No. of disjoint of a) $2^{k-1}$	cells required to implem b) 2 <sup>k-2</sup>	ent decoder for co c) 2 <sup>k</sup>	nvolutional codes are d) None of these
19)	The exponent (a) Free distant c) No. of deco		gives b) No. of decod d) Length of the	
20)	The parity ched	ck matrix of (n, k) block o	code is of the order	of
	a) n×k	b) $k \times n$	c) $(n-k) \times n$	d) $k \times (n-k)$

Seat No.

## B.E. (E and TC) (Part – I) Examination, 2016 CODING THEORY

-3-

Day and Date: Tuesday, 6-12-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data of necessary.

#### SECTION - I

2. A) Attempt any two:

12

Marks: 80

- a) A newly constructed flyover is likely to collapse. The chance that design is faulty is 0.5. The chance that flyover will collapse if the design is faulty is 0.95 otherwise it is 0.30. The flyover collapsed. What is the probability that flyover will collapse because of faulty design?
- b) For (7, 4) cyclic code, check whether given generator polynomial  $g(x) = 1 + x^2 + x^3$  generates cyclic code or not.
- c) The generator matrix of (6, 3) systematic block code is given by

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Find decoding table.

B) For (7, 3) block code for a given parity matrix

8

$$P = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

- i) What is the generator matrix for this code?
- ii) Find all the code words.
- iii) What will be the error-correcting capability?
- iv) What will be the error-detecting capability?



### 3. A) Attempt any two:

8

- a) The generator polynomial for (15, 7) cyclic code is  $g(x) = 1 + x^4 + x^6 + x^7 + x^8$ . Find the code vector for message polynomial  $m(x) = x^2 + x^3 + x^4$  using systematic method.
- b) How error detection and correction is done in cyclic code? Explain it.
- c) State and prove Bayes theorem.
- B) a) Find the value of k such that following will be probability density function.

$$f_x(x) = k.x$$
  $0 \le x \le 1$   
= k  $1 \le x \le 2$   
= k(3-x)  $2 \le x \le 3$ 

Also find  $P(x \le 1.5)$ .

8

- b) A card is drawn at random from an ordinary deck of 52 playing cards. Find the probability of being:
- 4

- i) an ace
- ii) a six or a heart.

### SECTION - II

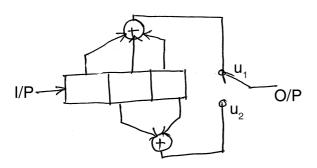
### 4. A) Attempt any three:

12

- a) Explain maximum likelihood algorithm used in convolutional codes.
- b) For convolutional encoder, whose generator sequences are  $g_1 = 111$ ,  $g_2 = 101$ :
  - i) Draw state diagram representing starting state and ending state separately.
  - ii) Write state equations.
- c) Define:
  - i) Coding gain
  - ii) Catastrophic error propagation.
- d) Explain in brief Turbo encoder.



B) For the given convolutional encoder.



- i) Draw encoder trellis diagram.
- ii) Find transfer function.

### 5. A) Attempt any two:

10

8

- a) Explain principle of iterative Turbo decoding.
- b) Explain soft decision Viterbi decoding.
- c) Explain how impulse response can be used to find encoded sequence of convolutional encoder.
- B) For a convolutional encoder rate =  $\frac{1}{2}$ , generator sequences are  $g_1 = 111$  and  $g_2 = 101$ :
  - i) Draw encoder trellis diagram.
  - ii) Draw decoder trellis diagram.
  - iii) Find encoded output for input message 1010 from trellis diagram.

	7	
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	•	(Part – II) ROADBAND CO	•	•	on,	2016
•	d Date : Monday, 21 3.00 p.m. to 6.00 p.					Total Marks: 100
1	2) <b>A</b> <b>D</b>	Answer Book Pag nswer MCQ/Objec	e N ctive ntion	o. 3. Each ques e type question n, Q.P. Set (P/Q/	tion <b>s o</b> i	in <b>first 30 minutes</b> carries <b>one</b> mark. n <b>Page No. 3 only.</b> <b>6) on Top of Page.</b>
D	00 Min. 1.	MCQ/Objective T	уре	Questions		Mada 00
Duratio	n : 30 Minutes					Marks : 20
1. Ch	oose the correct an	swer:				20
1)	User data is transfe a) LAPF control c) Circuit switching		b)	ame mode proto LAPF core None of these	oco	I
2)	Which of the follow a) Frame relay c) Circuit switching		b)	ole frame mode Frame switchin None of these	•	tocol
3)	ISDN uses a) TDM-PCM		_	nd modulation so Both a) and b)		
4)	ISDN uses a) Inband signaling c) Common chann		,	Outband signal None of these	ing	
5)	Maximum capacity a) 192 Kbps	with basic access b) 1.5 Mbps		ISDN is 64 Kbps	d)	None of these
6)	The main data cha a) B channel	•			d)	None of these
7)	TE of type 1 means a) ISDN device c) Terminal adapte		,	Non-ISDN devi	се	
8)	Primary access me a) 30 B + 1D		c)	Both a) and b)	d)	None of these
9)	AAL type 1 means					

a) conn.oreinted, constant bit ratec) conn.less, constant bit rate

b) conn.oriented, variable bit rated) none of these

10)	GFC is required at _ a) Network network c) User-user		terface. b) User-network d) None of these		
11)	Maximum number of a) Input buffers c) Crosspoint buffe	·	ired in case of b) Output buffers d) None of these	i	
12)	Output lines same a a) Funnel type c) Extended matrix	·	se of ne b) Shuffle exchar d) None of these		rk.
13)	<ul> <li>ATM breaks all traf</li> <li>a) 53-Byte cells are</li> <li>b) 53-Byte cells are</li> <li>c) 53-Byte cells are</li> <li>d) 53-Byte cells are</li> <li>communication</li> </ul>	e the ideal size for e the ideal size for e the ideal size for	the voice communication of the	ion	
14)	E-mail isa) Conversational			d)	None of these
15)	Virtual path is made a) Circuits	•	c) Cells	d)	None of these
16)	<ul><li>Which of the follow</li><li>a) Cell multiplexing</li><li>b) Generic flow cor</li><li>c) Transmission fra</li><li>d) Monitoring of the actions</li></ul>	and demultiplexin ntrol ame generation/re	covery		
17)	What advantages d a) Unlike ATM, time grabbed by anote b) It is cheaper to it c) ATM is suitable d) Time slots for S	e slots provided b her user mplement for real time traffic	by STM for a partic	cular	user cannot be
18)	ISDN relies on stan a) 192 Kbps	dard voice data ra b) 64 Kbps		d)	None of these
19)	Basic access mear a) B + D	•	,	,	None of these
20)	Which of the followi	•	nighest data rate?	d)	None of these

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No.	

## B.E. (E and TC) (Part – II) (Old) Examination, 2016 BROADBAND COMMUNICATION

Marks: 80 Day and Date: Monday, 21-11-2016 Time: 3.00 p.m. to 6.00 p.m. **Instruction**: **All** questions are **compulsory**. SECTION - I 2. Answer any four:  $(4 \times 5 = 20)$ a) Explain X.25 packet switching protocol. 5 b) Discuss various link layer core parameters. c) Explain in detail integration of transmission and switching. 5 d) Explain ISDN architecture. 5 e) Write a note on ISDN addressing. 5 3. Answer any two:  $(2\times10=20)$ 10 a) Along with proper diagram discuss I-series of recommendations. 10 b) Explain in detail frame mode protocol architecture. c) Explain ISDN interworking. 10 SECTION - II 4. Write notes on any four:  $(4 \times 5 = 20)$ a) B-ISDN services 5 5 b) Header Error Control (HEC) c) AAL services and protocols 5 d) ATM switching element 5 e) Buffering in ATM. 5 5. Answer any two:  $(2\times10=20)$ a) Explain the call establishement using VP. 10 b) Draw and explain cell delineation state diagram. 10 c) Draw and explain neat diagram of extended matrix switching element. 10

Seat	
No.	

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t Q

# B.E. (E and TC) (Part – II) (Old) Examination, 2016 BROADBAND COMMUNICATION

Day and Date: Monday, 21-11-2016 Total Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

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

### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

### 1. Choose the correct answer:

20

- 1) Which of the following is done in the physical layer of the ATM network?
  - a) Cell multiplexing and demultiplexing
  - b) Generic flow control
  - c) Transmission frame generation/recovery
  - d) Monitoring of the user information field for bit errors and possible corrective actions
- 2) What advantages does ATM have over STM?
  - a) Unlike ATM, time slots provided by STM for a particular user cannot be grabbed by another user
  - b) It is cheaper to implement
  - c) ATM is suitable for real time traffic but not ATM
  - d) Time slots for STM occurs at regular intervals
- 3) ISDN relies on standard voice data rate of
  - a) 192 Kbps
- b) 64 Kbps
- c) 1.5 Mbps
- d) None of these

- 4) Basic access means
  - a) B + D
- b) 2B + 1D
- c) 4B + D
- d) None of these
- 5) Which of the following channels has highest data rate?
  - a) B channel
- b) H channel
- c) D channel
- d) None of these
- 6) User data is transferred in which of the frame mode protocol
  - a) LAPF control

b) LAPF core

c) Circuit switching

d) None of these



7)	Which of the following is slower but re a) Frame relay c) Circuit switching		reliable frame mode protocol b) Frame switching d) None of these			
8)	ISDN usesa) TDM-PCM	multiplexin	ga c)	nd modulation something Both a) and b)	che d)	me. None of these
9)	ISDN uses a) Inband signaling c) Common chann		<ul><li>b) Outband signaling</li><li>d) None of these</li></ul>			
10)	Maximum capacity a) 192 Kbps				d)	None of these
11)	The main data char a) B channel	•			d)	None of these
12)	TE of type 1 means a) ISDN device c) Terminal adapte		,	Non-ISDN devi None of these	ce	
13)	Primary access me a) 30 B + 1D		c)	Both a) and b)	d)	None of these
14)	AAL type 1 means a) conn.oreinted, c c) conn.less, cons		•	conn.oriented, none of these	vari	able bit rate
15)	GFC is required at an an element network network or User-user		b)	ace. User-network None of these		
16)	Maximum number a) Input buffers c) Crosspoint buffe	·	b)	d in case of Output buffers None of these		
17)	Output lines same a) Funnel type c) Extended matrix		b)			rk.
18)	8) ATM breaks all traffic into 53-Byte cells because a) 53-Byte cells are the ideal size for the voice communication b) 53-Byte cells are the ideal size for data communication c) 53-Byte cells are the ideal size for circuit switching d) 53-Byte cells are the compromized size for both voice and data communication					
19)	E-mail isa) Conversational			vice. Retrieval	d)	None of these
20)	Virtual path is mada) Circuits	e up of virtual b) Channels	c)	Cells	d)	None of these

Marks: 80

Set Q



Seat	
No.	

### B.E. (E and TC) (Part – II) (Old) Examination, 2016 **BROADBAND COMMUNICATION**

Day and Date: Monday, 21-11-2016 Time: 3.00 p.m. to 6.00 p.m. **Instruction**: **All** questions are **compulsory**. SECTION - I 2. Answer any four:  $(4 \times 5 = 20)$ a) Explain X.25 packet switching protocol. 5 b) Discuss various link layer core parameters. c) Explain in detail integration of transmission and switching. 5 d) Explain ISDN architecture. 5 e) Write a note on ISDN addressing. 5 3. Answer any two:  $(2\times10=20)$ 10 a) Along with proper diagram discuss I-series of recommendations. b) Explain in detail frame mode protocol architecture. 10 c) Explain ISDN interworking. 10 SECTION - II 4. Write notes on any four:  $(4 \times 5 = 20)$ a) B-ISDN services 5 b) Header Error Control (HEC) 5 c) AAL services and protocols 5 d) ATM switching element 5 e) Buffering in ATM. 5 5. Answer any two:  $(2\times10=20)$ a) Explain the call establishement using VP. 10 b) Draw and explain cell delineation state diagram. 10 c) Draw and explain neat diagram of extended matrix switching element. 10


actions

### **SLR-EP - 153**

No. Set F	Seat No.
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` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	– II) (Old) Examination, 2016 D COMMUNICATION
Day and Date: Monday, 21-11-2016 Time: 3.00 p.m. to 6.00 p.m.	Total Marks : 100
in Answer Bo 2) <b>Answer MCC</b> <b>Don't forget</b>	npulsory. It should be solved in first 30 minutes ok Page No. 3. Each question carries one mark. Objective type questions on Page No. 3 only. o mention, Q.P. Set (P/Q/R/S) on Top of Page. are compulsory.
MCQ/Obje Duration: 30 Minutes	tive Type Questions  Marks : 20
Choose the correct answer:	20
<ol> <li>Maximum number of buffers a         <ul> <li>a) Input buffers</li> <li>c) Crosspoint buffers</li> </ul> </li> <li>Output lines same as input line         <ul> <li>a) Funnel type</li> <li>c) Extended matrix</li> </ul> </li> <li>ATM breaks all traffic into 53-B         <ul> <li>a) 53-Byte cells are the ideal s</li> <li>b) 53-Byte cells are the ideal s</li> <li>c) 53-Byte cells are the ideal s</li> </ul> </li> </ol>	e required in case of b) Output buffers d) None of these s in case of network. b) Shuffle exchange d) None of these yte cells because ize for the voice communication ize for data communication
4) E-mail is type of B- a) Conversational b) Message	ISDN service. ing c) Retrieval d) None of these
5) Virtual path is made up of virtual a) Circuits b) Channe	al
<ul><li>a) Cell multiplexing and demultiple</li><li>b) Generic flow control</li><li>c) Transmission frame general</li></ul>	

7)	<ul> <li>What advantages does ATM have over STM?</li> <li>a) Unlike ATM, time slots provided by STM for a particular user cannot grabbed by another user</li> <li>b) It is cheaper to implement</li> <li>c) ATM is suitable for real time traffic but not ATM</li> <li>d) Time slots for STM occurs at regular intervals</li> </ul>						
8)	ISDN relies on standard v a) 192 Kbps b) 64			.5 Mbps	d)	None of these	
9)	Basic access means a) B + D b) 2B	B + 1D c)	) 4	B + D	d)	None of these	
10)	Which of the following cha a) B channel b) H o	annels has hig channel c			d)	None of these	
11)	User data is transferred in a) LAPF control c) Circuit switching	b)	) L	me mode proto APF core Ione of these	col		
12)	<ul><li>Which of the following is s</li><li>a) Frame relay</li><li>c) Circuit switching</li></ul>	b)	) F	e frame mode p rame switching lone of these		cocol	
13)	a) TDM-PCM b) FD					me. None of these	
14)	<ul><li>ISDN uses</li><li>a) Inband signaling</li><li>c) Common channel signal</li></ul>	•	•	Outband signali Ione of these	ng		
15)	Maximum capacity with b a) 192 Kbps b) 1.5			SDN is 4 Kbps	d)	None of these	
16)	The main data channel fo a) B channel b) D c	-		ıser is I channel	d)	None of these	
17)	TE of type 1 means a) ISDN device c) Terminal adapter		,	Ion-ISDN devid	е		
18)	Primary access means a) 30 B + 1D b) 23	B + 1 D c)	) B	Soth a) and b)	d)	None of these	
19)	AAL type 1 means a) conn.oreinted, constar c) conn.less, constant bit	•	,	onn.oriented, v	/ari	able bit rate	
20)	GFC is required at a) Network network c) User-user	•	) L	ce. Iser-network Ione of these			

Marks: 80

Set R



Seat	
No.	

Day and Date: Monday, 21-11-2016

# B.E. (E and TC) (Part – II) (Old) Examination, 2016 BROADBAND COMMUNICATION

Time: 3.00 p.m. to 6.00 p.m. **Instruction**: **All** questions are **compulsory**. SECTION - I 2. Answer any four:  $(4 \times 5 = 20)$ a) Explain X.25 packet switching protocol. 5 b) Discuss various link layer core parameters. c) Explain in detail integration of transmission and switching. 5 d) Explain ISDN architecture. 5 e) Write a note on ISDN addressing. 5 3. Answer any two:  $(2\times10=20)$ 10 a) Along with proper diagram discuss I-series of recommendations. b) Explain in detail frame mode protocol architecture. 10 c) Explain ISDN interworking. 10 SECTION - II 4. Write notes on any four:  $(4 \times 5 = 20)$ a) B-ISDN services 5 b) Header Error Control (HEC) 5 c) AAL services and protocols 5 d) ATM switching element 5 e) Buffering in ATM. 5 5. Answer any two:  $(2\times10=20)$ a) Explain the call establishement using VP. 10 b) Draw and explain cell delineation state diagram. 10 c) Draw and explain neat diagram of extended matrix switching element. 10

Seat	
No.	
110.	

B.E. (E and TC) (Part – II) BROADBAND C	
Day and Date: Monday, 21-11-2016 Time: 3.00 p.m. to 6.00 p.m.	Total Marks : 100
in Answer Book Pa 2) <b>Answer MCQ/Obje</b>	sory. It should be solved in first 30 minutes age No. 3. Each question carries one mark. ective type questions on Page No. 3 only. ention, Q.P. Set (P/Q/R/S) on Top of Page. compulsory.
MCQ/Objective Duration: 30 Minutes	<b>Type Questions</b> Marks : 20
Choose the correct answer:	20
1) The main data channel for ordinary	ISDN user is
a) B channel b) D channel	c) H channel d) None of these
<ul><li>2) TE of type 1 means</li><li>a) ISDN device</li><li>c) Terminal adapter</li></ul>	<ul><li>b) Non-ISDN device</li><li>d) None of these</li></ul>
<ul><li>3) Primary access means</li><li>a) 30 B + 1D</li><li>b) 23 B + 1 D</li></ul>	c) Both a) and b) d) None of these
<ul><li>4) AAL type 1 means</li><li>a) conn.oreinted, constant bit rate</li><li>c) conn.less, constant bit rate</li></ul>	<ul><li>b) conn.oriented, variable bit rate</li><li>d) none of these</li></ul>
<ul><li>5) GFC is required ati</li><li>a) Network network</li><li>c) User-user</li></ul>	interface. b) User-network d) None of these
<ul><li>6) Maximum number of buffers are req</li><li>a) Input buffers</li><li>c) Crosspoint buffers</li></ul>	uired in case of b) Output buffers d) None of these
<ul><li>7) Output lines same as input lines in c</li><li>a) Funnel type</li><li>c) Extended matrix</li></ul>	ase of network. b) Shuffle exchange d) None of these
<ul> <li>8) ATM breaks all traffic into 53-Byte c</li> <li>a) 53-Byte cells are the ideal size fo</li> <li>b) 53-Byte cells are the ideal size fo</li> <li>c) 53-Byte cells are the ideal size fo</li> <li>d) 53-Byte cells are the compromize</li> </ul>	or the voice communication or data communication or circuit switching
communication	PTO

a) Frame relay b) Frame switching

c) Circuit switching

d) None of these

\_ multiplexing and modulation scheme. 18) ISDN uses

a) TDM-PCM b) FDM-AM c) Both a) and b) d) None of these

19) ISDN uses

a) Inband signaling

b) Outband signaling

c) Common channel signaling

d) None of these

20) Maximum capacity with basic access of ISDN is

a) 192 Kbps

b) 1.5 Mbps

c) 64 Kbps

d) None of these

Set S



Seat	
No.	

# B.E. (E and TC) (Part – II) (Old) Examination, 2016 BROADBAND COMMUNICATION

Marks: 80 Day and Date: Monday, 21-11-2016 Time: 3.00 p.m. to 6.00 p.m. **Instruction**: **All** questions are **compulsory**. SECTION - I 2. Answer any four:  $(4 \times 5 = 20)$ a) Explain X.25 packet switching protocol. 5 b) Discuss various link layer core parameters. c) Explain in detail integration of transmission and switching. 5 d) Explain ISDN architecture. 5 e) Write a note on ISDN addressing. 5 3. Answer any two:  $(2\times10=20)$ 10 a) Along with proper diagram discuss I-series of recommendations. b) Explain in detail frame mode protocol architecture. 10 c) Explain ISDN interworking. 10 SECTION - II 4. Write notes on any four:  $(4 \times 5 = 20)$ a) B-ISDN services 5 5 b) Header Error Control (HEC) c) AAL services and protocols 5 d) ATM switching element 5 e) Buffering in ATM. 5 5. Answer any two:  $(2\times10=20)$ a) Explain the call establishement using VP. 10 b) Draw and explain cell delineation state diagram. 10 c) Draw and explain neat diagram of extended matrix switching element. 10

		•

0 1			
Seat			
No.		Set	Р
	D.E. /Electronics	ond Talegommunication Engal (Dort II) (Old	•
	B.E. (Electronics	and Telecommunication Engg.) (Part – II) (Old)	
		Examination, 2016	

Day and Date: Tuesday, 22-11-2016 Max. Marks: 100

**AUDIO-VIDEO ENGINEERING** 

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Draw neat diagrams wherever necessary.

- 2) Assume suitable data, if necessary.
- 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

		MCQ/Objective T	ype Questions		
Duratio	on : 30 Minutes	•	••	Mar	rks : 20
1. Ch	oose the correct alte	ernatives :		(20:	×1=20)
1)	Static convergence A) Center			creen. D) Right	
2)	<ul><li>Which of the follow</li><li>A) The lens inverts</li><li>B) The composite blanking</li><li>C) The standard composite sync</li><li>D) The plumbicon</li></ul>	the optical image video signal incl omposite video fr	udes the camera som a camera is 1	signal and syncr / p-p with negati	not
3)	In color picture tube adjustments.  A) After		uld be done C) Either way	•	ʻity
4)	Which of the follow A) H retrace	-		D) V trace	
5)	How many H lines A) 19 lines	are there in a com B) 21 lines	•	D) 600 lines	
6)	How many H lines A) One	are there in each \ B) Two	V retrace ? C) Three	D) Four	
7)	What are the freque		•	lanking ? D) 30,050 Hz	



8)	<ul> <li>Which of the follow</li> <li>A) Line pairing indi</li> <li>B) People look too t</li> <li>C) A person can apof nonlinear hor</li> <li>D) The keystone e</li> </ul>	cates poor interlactal and too thin on a ppear to have one izontal scanning	a squ sho	ulder wider thar	•			
9)	What does the color fringing on the edge of the picture shows?  A) Misconvergence B) Insufficient signal drive C) Turned off guns D) Red cloud							
10)	In video signal and signal, for two horiz A) Camera signal	zontal lines in the p	pictu	ıre?		•		
11)	What are the appro	,	ds fo	•	trac			
12)	Which pulses in V I A) V sync	•						
13)	Which pulses in V I A) V sync	blanking correspor B) V blanking				All of these		
14)	The average dc lev A) Light C) Either dark or lig		B)	ing level for a _ Dark Neither dark no				
15)	The color with the rA) Red	most luminance is B) Yellow		Green	D)	Blue		
16)	What is the hue of A) Yellow	a color 90° leading B) Cyan		nc burst phase <sup>•</sup> Blue		Orange		
17)	The second IF value A) 0.5 MHz	ue for color in rece B) 1.3 MHz		s, for any statio 3.58 MHz		6 4.5 MHz		
18)	If the 3.58 – MHz C A) No color C) Too much blue	amplifier in the rec	B)	r does not opera No red Too much yello		the result will be		
19)	Which system can A) CEO	be used for both re B) VHD		ding and playba Laser disk		? VHS		
20)	The hue 180° out of A) Cyan	of phase with red is B) Yellow		Green	D)	Blue		

Set P



Sea No.		
IVO.	B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old Examination, 2016 AUDIO-VIDEO ENGINEERING	)
•	/ and Date : Tuesday, 22-11-2016 Mark ne : 3.00 p.m. to 6.00 p.m.	s:80
	Instructions: 1) Draw neat diagrams wherever necessary. 2) Assume suitable data, if necessary.	
	SECTION - I	
2.	Attempt any four:  1) Explain principle of recording in brief.  2) What is DC and AC biasing?  3) Write short note on audio capture and compression.  4) Explain vestigial side band transmission.  5) Brief the factors that decides choice of IF in TV systems.	16
3.	<ol> <li>Solve any three:</li> <li>Draw and explain the receiver of monochrome TV.</li> <li>Draw and explain the disc recording system.</li> <li>List the elements of multimedia system and explain need of multimedia audi video applications.</li> <li>Draw and explain the construction of image orthicon tube.</li> </ol>	<b>24</b> 0
	SECTION - II	
4.	Write short note on: 1) Interleaving process. 2) Chromaticity diagram. 3) AFT and AGC. 4) Satellite television.	16
5.	<ol> <li>Solve any three:</li> <li>Draw the block diagram of PAL coder and decoder and explain in brief.</li> <li>Draw the block diagram of HDTV and explain in brief.</li> <li>Draw and explain the principle of DVD player. Explain recording and play back in detail.</li> </ol>	24

4) Compare PAL SECAM and NTSC systems.

blanking

sync

	8			<b>SLR-EP – 15</b>	4
Seat No.				Set Q	_
E	3.E. (Electronics	Examinat	unication Engg ion, 2016 ENGINEERING	.) (Part – II) (Old)	
•	nd Date : Tuesday, 2 : 3.00 p.m. to 6.00 p			Max. Marks : 10	ЭC
	3) ( 4) 1	Assume suitable d Q. No. <b>1</b> is <b>compul</b> In Answer Book Pa <b>Answer MCQ/Obj</b>	lata, if <b>necessary</b> . <b>sory</b> . It should be s age No. <b>3. Each</b> qu <b>ective type questic</b>	ssary. olved in <b>first 30 minutes</b> estion carries <b>one</b> mark. <b>ons on Page No. 3 only.</b> <b>'Q/R/S) on Top of Page.</b>	
Durati	ion : 30 Minutes	MCQ/Objective	Type Questions	Marks : <i>1</i>	20
	hoose the correct a		a ayaa byyat abaa	(20×1=2	U
ı	<ul><li>) What is the hue o</li><li>A) Yellow</li></ul>	B) Cyan	C) Blue	D) Orange	
2	t) The second IF va A) 0.5 MHz		eivers, for any sta C) 3.58 MHz	tion, is D) 4.5 MHz	
3	s) If the 3.58 – MHz ( A) No color C) Too much blue	•	ceiver does not op B) No red D) Too much ye	erate, the result will be llow	
4	<ul><li>Which system can</li><li>A) CEO</li></ul>	n be used for both B) VHD	recording and play C) Laser disk	/back ? D) VHS	
5	i) The hue 180° out A) Cyan	of phase with red B) Yellow	is C) Green	D) Blue	
6	<ul><li>Static convergence</li><li>A) Center</li></ul>	ce is done for the _ B) Edges	of the	e screen. D) Right	
7		ts the optical imag	_	of the camera tube a signal and syncnot	

C) The standard composite video from a camera is 1V p-p with negative

D) The plumbicon uses a lead oxide layer for the target plate

P.T.O.

8)	In color picture tube adjustments.	e, degaussing sho	uld be done		the color purity
	A) After	B) Before	C) Either way	D)	None at all
9)	Which of the follow A) H retrace	ing takes more tim B) H trace	ne ? C) V retrace	D)	V trace
10)	How many H lines A) 19 lines		plete frame ? C) 262½ lines	D)	600 lines
11)	How many H lines A) One	are there in each \ B) Two	/ retrace ? C) Three	D)	Four
12)	What are the freque		•		king ? 30,050 Hz
13)	<ul><li>Which of the follow</li><li>A) Line pairing indi</li><li>B) People look too t</li><li>C) A person can ap of nonlinear hor</li><li>D) The keystone e</li></ul>	cates poor interlact all and too thin on a opear to have one izontal scanning	square raster on the shoulder wider than		
14)	What does the cold A) Misconvergence B) Insufficient sign C) Turned off guns D) Red cloud	e al drive	dge of the picture s	how	rs ?
15)	In video signal and signal, for two horiz A) Camera signal	zontal lines in the p			omposite video All of the above
16)	What are the appro	oximate time perio	,		
17)	Which pulses in V I A) V sync	olanking correspor	,	wide	e?
18)	Which pulses in V I A) V sync		nd to the 31,500 Hz C) Equalizing		All of these
19)	The average dc lev A) Light C) Either dark or light	vel is close to the b	, .		scene.
20)	The color with the r		C) Green		Blue

Set Q



Sea No.		
	B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016 AUDIO-VIDEO ENGINEERING	
•	y and Date : Tuesday, 22-11-2016 Mark ne : 3.00 p.m. to 6.00 p.m.	s : 80
	Instructions: 1) Draw neat diagrams wherever necessary. 2) Assume suitable data, if necessary.	
	SECTION-I	
2.	Attempt any four:  1) Explain principle of recording in brief.  2) What is DC and AC biasing?  3) Write short note on audio capture and compression.  4) Explain vestigial side band transmission.  5) Brief the factors that decides choice of IF in TV systems.	16
3.	<ol> <li>Solve any three:</li> <li>Draw and explain the receiver of monochrome TV.</li> <li>Draw and explain the disc recording system.</li> <li>List the elements of multimedia system and explain need of multimedia audi video applications.</li> <li>Draw and explain the construction of image orthicon tube.</li> </ol>	<b>24</b> 0
	SECTION - II	
4.	Write short note on:  1) Interleaving process.  2) Chromaticity diagram.  3) AFT and AGC.  4) Satellite television.	16
5.	<ol> <li>Solve any three:</li> <li>Draw the block diagram of PAL coder and decoder and explain in brief.</li> <li>Draw the block diagram of HDTV and explain in brief.</li> <li>Draw and explain the principle of DVD player. Explain recording and play back in detail.</li> <li>Compare PAL SECAM and NTSC systems.</li> </ol>	24

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ı			

A) No color

C) Too much blue

					SLR-EP –	154
Sea No.					Set	R
	В	.E. (Electronics	Examina	nunication Engg ation, 2016 ENGINEERING	.) (Part – II) (Old	<b> </b>
•		d Date : Tuesday, 3.00 p.m. to 6.00 p			Max. Marks	s : 100
	1	2) . 3) . 4) .	Assume suitable ( Q. No. <b>1</b> is <b>compu</b> in Answer Book P <b>Answer MCQ/Ob</b>	ms wherever neces data, if necessary. Ilsory. It should be so Page No. 3. Each que jective type questic ention, Q.P. Set (P/	olved in <b>first 30 min</b> t estion carries <b>one</b> m <b>ons on Page No. 3 c</b>	nark. <b>only.</b>
D	- <b>!</b> : -	n . OO Minutoo	MCQ/Objective	e Type Questions	Maul	l.a . 00
		n : 30 Minutes				ks : 20
1.		oose the correct a			•	<b>&lt;1=20</b> )
	1)	What are the app A) 5	roximate time per B) 0.93	riods for the visible F C) 10.2	H trace ? D) 53.5	
	2)	Which pulses in \ A) V sync	/ blanking corresp B) V blanking	oond to the 21H line: C) Equalizing	s wide ? D) All of the abov	ve
	3)	Which pulses in \A) V sync	•	oond to the 31,500 F C) Equalizing		
	4)	A\ 1' 1 1		e blanking level for a B) Dark D) Neither dark		
	5)	The color with the A) Red	e most luminance B) Yellow	is C) Green	D) Blue	
	6)	What is the hue of A) Yellow	of a color 90° lead B) Cyan	ing sync burst phase C) Blue	e ? D) Orange	
	7)	The second IF va A) 0.5 MHz	ulue for color in re B) 1.3 MHz	ceivers, for any stat C) 3.58 MHz	tion, is D) 4.5 MHz	
	8)	If the 3.58 – MHz	C amplifier in the r	eceiver does not ope	,	эе

B) No red

D) Too much yellow



9)	Which system can A) CEO	be used for both re B) VHD	•		? VHS
10)	The hue 180° out o A) Cyan	f phase with red is B) Yellow		D)	Blue
11)	Static convergence A) Center	e is done for the B) Edges	C) Left		en. Right
12)	<ul><li>Which of the follow</li><li>A) The lens inverts</li><li>B) The composite blanking</li><li>C) The standard c sync</li><li>D) The plumbicon</li></ul>	the optical image video signal inclu omposite video fro	udes the camera some a camera is 10	sign / p-	al and syncnot p with negative
13)	In color picture tube adjustments.  A) After				
14)	Which of the follow A) H retrace	,	,	,	V trace
15)	How many H lines (A) 19 lines		plete frame ? C) 262½ lines	D)	600 lines
16)	How many H lines A) One	are there in each \ B) Two	/ retrace ? C) Three	D)	Four
17)	What are the freque A) 15,750 Hz	encies of H scanni B) 16,750 Hz			king ? 30,050 Hz
18)	<ul><li>Which of the follow</li><li>A) Line pairing indi</li><li>B) People look too t</li><li>C) A person can ap of nonlinear hori</li><li>D) The keystone et</li></ul>	cates poor interlact all and too thin on a opear to have one s izontal scanning	square raster on the shoulder wider thar	•	
19)	What does the cold A) Misconvergence B) Insufficient sign C) Turned off guns D) Red cloud	e al drive	dge of the picture sl	how	rs?
20)	In video signal and signal, for two horiz A) Camera signal	zontal lines in the p	oicture?		omposite video  All of the above  Set R

Set R



Sea		
No.	B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016 AUDIO-VIDEO ENGINEERING	
•	v and Date : Tuesday, 22-11-2016 Marks te : 3.00 p.m. to 6.00 p.m.	: 80
	Instructions: 1) Draw neat diagrams wherever necessary. 2) Assume suitable data, if necessary.	
	SECTION-I	
2.	Attempt any four:  1) Explain principle of recording in brief.  2) What is DC and AC biasing?  3) Write short note on audio capture and compression.  4) Explain vestigial side band transmission.  5) Brief the factors that decides choice of IF in TV systems.	16
3.	<ol> <li>Solve any three:</li> <li>Draw and explain the receiver of monochrome TV.</li> <li>Draw and explain the disc recording system.</li> <li>List the elements of multimedia system and explain need of multimedia audio video applications.</li> <li>Draw and explain the construction of image orthicon tube.</li> </ol>	24
	SECTION - II	
4.	Write short note on: 1) Interleaving process. 2) Chromaticity diagram. 3) AFT and AGC. 4) Satellite television.	16
5.	<ol> <li>Solve any three:</li> <li>Draw the block diagram of PAL coder and decoder and explain in brief.</li> <li>Draw the block diagram of HDTV and explain in brief.</li> <li>Draw and explain the principle of DVD player. Explain recording and play back in detail.</li> <li>Compare PAL SECAM and NTSC systems.</li> </ol>	24


A) 5

				<b>SLR-EP – 15</b> 4
Seat No.	t			Set S
	B.E. (Electronics	Examina	nunication Engg tion, 2016 ENGINEERING	.) (Part – II) (Old)
-	and Date : Tuesday, e : 3.00 p.m. to 6.00 p			Max. Marks: 100
	2)	Assume suitable of Q. No. 1 is compuing Answer Book Parametric Answer MCQ/Obj	age No. 3. <b>Each</b> qui <b>iective type questi</b> d	ssary.  colved in first 30 minutes estion carries one mark. cons on Page No. 3 only. (Q/R/S) on Top of Page.
		MCQ/Objective	Type Questions	
Dura	tion: 30 Minutes			Marks : 20
1. (	Choose the correct a	ılternatives :		(20×1=20
	<ol> <li>How many H line</li> <li>One</li> </ol>	s are there in eacl B) Two	n V retrace ? C) Three	D) Four
	B) People look to C) A person can of nonlinear h D) The keystone 4) What does the co	B) 16,750 Hz owing is not true? dicates poor interlotal and too thin or appear to have on orizontal scanning effect produces a blor fringing on the	C) 31,500 Hz acing a square raster on the shoulder wider the	D) 30,050 Hz the picture tube screen an the other because
	signal, for two ho	gnal drive ns	e picture ?	the composite video  D) All of the above

6) What are the approximate time periods for the visible H trace?

C) 10.2

B) 0.93

D) 53.5



7)	Which pulses in VI	•			
_,	A) V sync	,	, .	•	All of the above
8)	Which pulses in V I A) V sync	•	nd to the 31,500 Hz C) Equalizing		All of these
9)	The average dc lev A) Light C) Either dark or lig		B) Dark		
10)	The color with the I	most luminance is B) Yellow	C) Green	D)	Blue
11)	What is the hue of A) Yellow	_	g sync burst phase C) Blue		Orange
12)	The second IF value A) 0.5 MHz				
13)	If the 3.58 – MHz C A) No color C) Too much blue	amplifier in the rec	eiver does not oper B) No red D) Too much yelld		the result will be
14)	Which system can A) CEO		ecording and playb C) Laser disk		
15)	The hue 180° out of A) Cyan	-		D)	Blue
16)	Static convergence A) Center	e is done for the B) Edges	C) Left	cre D)	en. Right
17)	<ul><li>Which of the follow</li><li>A) The lens inverts</li><li>B) The composite blanking</li><li>C) The standard of</li></ul>	the optical image video signal inclu	udes the camera	sign	al and syncnot
	sync D) The plumbicon	uses a lead oxide l	ayer for the target	plate	Э
18)	In color picture tube adjustments.	e, degaussing shou	uld be done		the color purity
	A) After	B) Before	C) Either way	D)	None at all
19)	Which of the follow A) H retrace	ring takes more tim B) H trace	ne ? C) V retrace	D)	V trace
20)	How many H lines A) 19 lines		plete frame ? C) 262½ lines	D)	600 lines

Set S



Sea No.		
NO.	B.E. (Electronics and Telecommunication Engg.) (Part – II) (Old) Examination, 2016 AUDIO-VIDEO ENGINEERING	
•	v and Date : Tuesday, 22-11-2016 Marks : ne : 3.00 p.m. to 6.00 p.m.	: 80
	Instructions: 1) Draw neat diagrams wherever necessary. 2) Assume suitable data, if necessary.	
	SECTION - I	
2.	Attempt any four:  1) Explain principle of recording in brief.  2) What is DC and AC biasing?  3) Write short note on audio capture and compression.  4) Explain vestigial side band transmission.  5) Brief the factors that decides choice of IF in TV systems.	16
3.	<ol> <li>Solve any three:</li> <li>Draw and explain the receiver of monochrome TV.</li> <li>Draw and explain the disc recording system.</li> <li>List the elements of multimedia system and explain need of multimedia audio video applications.</li> <li>Draw and explain the construction of image orthicon tube.</li> </ol>	24
	SECTION - II	
4.	Write short note on: 1) Interleaving process. 2) Chromaticity diagram. 3) AFT and AGC. 4) Satellite television.	16
5.	<ol> <li>Solve any three:</li> <li>Draw the block diagram of PAL coder and decoder and explain in brief.</li> <li>Draw the block diagram of HDTV and explain in brief.</li> <li>Draw and explain the principle of DVD player. Explain recording and play back in detail.</li> </ol>	24

4) Compare PAL SECAM and NTSC systems.

Seat	
No.	

Set P

Max. Marks: 100

#### B.E. (E&TC) (Part – II) (Old) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each guestion carries one mark.

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if required.
- 4) Figure to right indicate full marks.

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

Duration: 30 Minutes Marks: 20

1. Choose the correct answer:

 $(20 \times 1 = 20)$ 

- 1) NRE cost can be defined by
  - a) The one time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded system
  - d) None of above
- 2) In SPI slave select input used as
  - a) SPI device as slave when SS active
  - b) Clock must be synchronized
  - c) SPI device as master when SS active
  - d) None of above
- 3) In I2C high speed mode high speed is given as
  - a) 400 Kbps
- b) 800 Kbps
- c) 1600 Kbps
- d) None of above

- 4) In embedded system, A cache provides
  - a) overall increase in performance
  - b) increase in execution time
  - c) through put decreases
  - d) none of above
- 5) AHB provides higher data through put than ASB because
  - a) It is based on bidirectional bus design
  - b) It is based on a centralized multiplexed bus scheme
  - c) It is based on unidirectional bus design
  - d) None of the above
- 6) Which of the following VIC having the highest priority?
  - a) Vectored interrupt request
- b) Non vectored interrupt request

c) Fast interrupt request

- d) None of the above
- 7) Embedded system specific trends are
  - a) Amount of memory

b) Real time constraints

c) Design time

d) All of above



8)	LPC2148 has a) 32 KB b)		gram memory. ) 8 KB	d)	512 KB	
9)	Total number of available a) 06 b)		2148 is )  12	d)	None of above	
10)	ARM 7 core has a Von Ne a) Data and instructions ( b) Data and instructions ( c) Core has five stage pip d) None of the above	use same bus use different bus	ecture where			
11)	A thread is aa) multi process c) light weight	b	) inter thread proces ) none of above	ss		
12)	What function are typically a) Memory Management c) All management function	b	ting system" ? ) Process schedulir ) User processes	ng		
13)	Real time operating systema) PDAS c) Cell phones	b	) Scientific instrume ) PDC	ents		
14)	<ul> <li>Inter process communication</li> <li>a) is required for all processes</li> <li>b) is usually done via disk drivers</li> <li>c) is never necessary</li> <li>d) all processes to synchronize activity</li> </ul>					
15)	The initial value of semaph section is a) 8 b)	·	one of the many prod ) 16	ces d)		
16)	Semaphore a) Synchronise critical re b) Are used to do I/O c) Are used for memory r d) None of above	sources to prevent	•	-,		
17)	Round-robin scheduling a) Allows interactive task b) Is quite complex to imp c) Gives each task the sa d) None of the above	lement				
18)	The FIFO algorithm  a) Execute first the job that b) Execute first the job that c) Execute first the job that d) None of above	at first entered the q	lueue			
19)	Linux uses what mechanis a) CPU controlled multita c) Pre-emptive multitaski	sking b	ch process is run ) Co-operating multi ) None of above	itas	king	
20)	PCB = a) Programming Control I c) Process Communication		) Program Control E ) None of above	Bloc	ek	

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l Nia	
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#### B.E. (E&TC) (Part – II) (Old) Examination, 2016 EMBEDDED SYSTEMS

-3-

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data if required.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain embedded system design challenges.
- 2) Explain recent trends in embedded system.
- 3) Explain the concept of RTC in LPC2148.
- 4) Explain the concept of watchdog timer for LPC2148.
- 5) Explain concept of three stage pipe line of ARM 7 processor.
- 6) Explain Bus architecture in ARM 7.

3. Solve any two questions:

- 1) Draw and explain with block diagram architecture of LPC 2148.
- 2) What do you mean by design metric? Explain the following design metrics.
  - i) Power
- ii) Time to market
- iii) Safety
- iv) NRE cost
- Draw the block diagram interfacing of graphics LCD with ARM processor. Explain in details.



#### SECTION - II

#### 4. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain features of RTOS.
- 2) Explain concept of semaphore with example.
- 3) Difference between micro kernel and monolithic kernel architecture.
- 4) Explain thread vs processes.
- 5) Linux file system.

#### 5. Solve any two questions:

- 1) Explain the concepts of mailbox in IPC. What are the function associated of mailbox in micro cos II ? Explain in details with associated diagram.
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Explain the concept of multithreading using p threads. Explain syslog and strace debug technique used in linux.

Seat	
No.	

Set Q

#### B.E. (E&TC) (Part – II) (Old) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if required.
- 4) Figure to right indicate full marks.

#### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

1. Choose the correct answer:

 $(20 \times 1 = 20)$ 

- 1) Semaphore
  - a) Synchronise critical resources to prevent dead lock
  - b) Are used to do I/O
  - c) Are used for memory management
  - d) None of above
- 2) Round-robin scheduling
  - a) Allows interactive task quicker access to processor
  - b) Is quite complex to implement
  - c) Gives each task the same chance at the processor
  - d) None of the above
- 3) The FIFO algorithm
  - a) Execute first the job that last entered the queue
  - b) Execute first the job that first entered the queue
  - c) Execute first the job that has been in the queue the longest
  - d) None of above
- 4) Linux uses what mechanism to determine which process is run
  - a) CPU controlled multitasking
- b) Co-operating multitasking
- c) Pre-emptive multitasking
- d) None of above

- 5) PCB =
  - a) Programming Control Block
- b) Program Control Block
- c) Process Communication Block
- d) None of above
- 6) NRE cost can be defined by
  - a) The one time monetary cost of designing the system
  - b) Life time cost of system
  - c) Depends upon embedded system
  - d) None of above



7)	In SPI slave select input a) SPI device as slave b) Clock must be sync c) SPI device as maste d) None of above	when SS active hronized				
8)	In I2C high speed mode a) 400 Kbps			1600 Kbps	d)	None of above
9)	In embedded system, A a) overall increase in p b) increase in executio c) through put decreas d) none of above	erformance n time				
10)	AHB provides higher da a) It is based on bidired b) It is based on a cent c) It is based on unidired d) None of the above	ctional bus design ralized multiplexed b				
11)	<ul><li>Which of the following V</li><li>a) Vectored interrupt re</li><li>c) Fast interrupt request</li></ul>	equest	b)	riority ? Non vectored inter None of the above		t request
12)	Embedded system spec a) Amount of memory c) Design time	cific trends are	,	Real time constrai All of above	nts	
13)	LPC2148 hasa) 32 KB	on chip flash pr o) 64 KB			d)	512 KB
14)	Total number of available a) 06 kg	le ADC inputs for LP  o) 08	C 2 c)		d)	None of above
15)	ARM 7 core has a Von a) Data and instruction b) Data and instruction c) Core has five stage d) None of the above	s use same bus s use different bus	itec	ture where		
16)	A thread is a a) multi process c) light weight	process.	,	inter thread proces	SS	
17)	What function are typica a) Memory Managemen c) All management fund	nt	b)	ng system" ? Process schedulir User processes	ng	
18)	Real time operating systa) PDAS c) Cell phones	tems can be found ir	b)	Scientific instrume PDC	ents	
19)	a) Inter process communication a) is required for all processes c) is never necessary b) is usually done via disk drivers d) all processes to synchronize activity					
20)	The initial value of sema section is a) 8	phore that allows onl	y o		d)	

-3-

Seat	
No.	

# B.E. (E&TC) (Part – II) (Old) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data if required.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain embedded system design challenges.
- 2) Explain recent trends in embedded system.
- 3) Explain the concept of RTC in LPC2148.
- 4) Explain the concept of watchdog timer for LPC2148.
- 5) Explain concept of three stage pipe line of ARM 7 processor.
- 6) Explain Bus architecture in ARM 7.

3. Solve any two questions:

- 1) Draw and explain with block diagram architecture of LPC 2148.
- 2) What do you mean by design metric? Explain the following design metrics.
  - i) Power
- ii) Time to market
- iii) Safety
- iv) NRE cost
- 3) Draw the block diagram interfacing of graphics LCD with ARM processor. Explain in details.



#### SECTION - II

#### 4. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain features of RTOS.
- 2) Explain concept of semaphore with example.
- 3) Difference between micro kernel and monolithic kernel architecture.
- 4) Explain thread vs processes.
- 5) Linux file system.

#### 5. Solve any two questions:

- 1) Explain the concepts of mailbox in IPC. What are the function associated of mailbox in micro cos II ? Explain in details with associated diagram.
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Explain the concept of multithreading using p threads. Explain syslog and strace debug technique used in linux.

Seat	
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#### B.E. (E&TC) (Part - II) (Old) Examination, 2016 **EMBEDDED SYSTEMS**

Day and Date: Wednesday, 23-11-2016 Max. Marks: 100

•	3.00 p.m. to 6.00 p.m	•			IVIO	ax. Marks . 100
	2) 3)	Answer Book Pa  Answer MCQ/O	ge No. 3. I bjective ty on, Q.P. Se data if red	Each quest pe quest et (P/Q/F quired.	be solved in first 30 restion carries one mations on Page No. 3 on R/S) on Top of Page.	ark. <b>only. Don't</b>
		MCQ/Objec	tive Type	Questio	ns	
Duration	: 30 Minutes					Marks : 20
1. Cho	oose the correct an	swer:				(20×1=20)
1)	A thread is a a) multi process c) light weight	proces	b)	inter thro	ead process above	
2)	What function are a) Memory Manage c) All managemen	gement	b)	Process	m" ? s scheduling ocesses	
3)	Real time operating a) PDAS c) Cell phones	g systems can be	b)	Scientifi PDC	c instruments	
4)	Inter process comi a) is required for c) is never neces	all processes			ly done via disk drive esses to synchronize	
5)	The initial value of section is a) 8	semaphore that all	•	ne of the 16	many processes to er	nter critical
6)	Semaphore a) Synchronise or b) Are used to do c) Are used for m d) None of above	ritical resources to I/O emory manageme	prevent d		,	
7)	Round-robin sched a) Allows interact b) Is quite comple c) Gives each tas d) None of the ab	ive task quicker a ex to implement sk the same chanc	·			
8)	The FIFO algorithma) Execute first thb) Execute first thc) Execute first thd) None of above	e job that last ente e job that first ente e job that has bee	ered the qu	eue	ongest	



9)	Linux uses what mechanism to determine v	vhic	h process is run		
	a) CPU controlled multitasking	•	Co-operating multi	tas	king
	c) Pre-emptive multitasking	d)	None of above		
10)	PCB =				
	a) Programming Control Block	b)	Program Control E	3loc	k
	c) Process Communication Block	d)	None of above		
11)	NRE cost can be defined by				
,	a) The one time monetary cost of designin	g th	ie system		
	b) Life time cost of system				
	c) Depends upon embedded system				
	d) None of above				
12)	In SPI slave select input used as				
	a) SPI device as slave when SS active				
	b) Clock must be synchronized				
	c) SPI device as master when SS active				
	d) None of above				
13)	In I2C high speed mode high speed is given				<b>N</b> . ( )
	a) 400 Kbps b) 800 Kbps	C)	1600 Kbps	a)	None of above
14)	In embedded system, A cache provides				
	a) overall increase in performance				
	b) increase in execution time				
	<ul><li>c) through put decreases</li><li>d) none of above</li></ul>				
4 5	•	۸.	Dhaaa		
15)	AHB provides higher data through put than	A5	B because		
	<ul><li>a) It is based on bidirectional bus design</li><li>b) It is based on a centralized multiplexed</li></ul>	hus	scheme		
	c) It is based on a definalized maniplexed	bus	Scrience		
	d) None of the above				
16)	Which of the following VIC having the higher	st r	riority ?		
. 0,	a) Vectored interrupt request	-	Non vectored inter	rup	t request
	c) Fast interrupt request	,	None of the above	•	•
17)	Embedded system specific trends are				
,	a) Amount of memory	b)	Real time constrain	nts	
	c) Design time	ď)	All of above		
18)	LPC2148 has on chip flash p	rog	ram memory.		
,	a) 32 KB b) 64 KB	_	8 KB	d)	512 KB
19)	Total number of available ADC inputs for LF	PC 2	2148 is		
,	a) 06 b) 08		12	d)	None of above
20)	ARM 7 core has a Von Neumann-style arch	nite	cture where		
-,	a) Data and instructions use same bus				
	b) Data and instructions use different bus				
	c) Core has five stage pipeline				
	d) None of the above				

Seat	
No.	

# B.E. (E&TC) (Part – II) (Old) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data if required.

2) Figure to right indicate full marks.

#### SECTION - I

#### 2. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain embedded system design challenges.
- 2) Explain recent trends in embedded system.
- 3) Explain the concept of RTC in LPC2148.
- 4) Explain the concept of watchdog timer for LPC2148.
- 5) Explain concept of three stage pipe line of ARM 7 processor.
- 6) Explain Bus architecture in ARM 7.

#### 3. Solve any two questions:

- 1) Draw and explain with block diagram architecture of LPC 2148.
- 2) What do you mean by design metric? Explain the following design metrics.
  - i) Power
- ii) Time to market
- iii) Safety
- iv) NRE cost
- Draw the block diagram interfacing of graphics LCD with ARM processor. Explain in details.



#### SECTION - II

#### 4. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain features of RTOS.
- 2) Explain concept of semaphore with example.
- 3) Difference between micro kernel and monolithic kernel architecture.
- 4) Explain thread vs processes.
- 5) Linux file system.

#### 5. Solve any two questions:

- 1) Explain the concepts of mailbox in IPC. What are the function associated of mailbox in micro cos II ? Explain in details with associated diagram.
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Explain the concept of multithreading using p threads. Explain syslog and strace debug technique used in linux.

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Seat	
No.	

#### B.E. (E&TC) (Part - II) (Old) Examination, 2016 **EMBEDDED SYSTEMS**

Day and Date: Wednesday, 23-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

2) Answer MCQ/Objective type questions on Page No. 3 only. Don't

	forget to mention, Q.F 3) Assume suitable data it 4) Figure to right indicate	P. S f red	et (P/Q/R/S) on Top of Page. quired.
D	MCQ/Objective Ty	/pe	
Duration	: 30 Minutes		Marks : 20
1. Cho	pose the correct answer:		(20×1=20)
1)	<ul><li>Which of the following VIC having the highe</li><li>a) Vectored interrupt request</li><li>c) Fast interrupt request</li></ul>	b)	riority ? Non vectored interrupt request None of the above
2)	Embedded system specific trends are a) Amount of memory c) Design time	,	Real time constraints All of above
3)	LPC2148 has on chip flash per a) 32 KB b) 64 KB		ram memory. 8 KB d) 512 KB
4)	Total number of available ADC inputs for LF a) 06 b) 08		2148 is 12 d) None of above
5)	ARM 7 core has a Von Neumann-style archa) Data and instructions use same bus b) Data and instructions use different bus c) Core has five stage pipeline d) None of the above	nited	cture where
6)	A thread is a process. a) multi process c) light weight	,	inter thread process none of above
7)	What function are typically considered "ope a) Memory Management c) All management function	b)	ng system" ? Process scheduling User processes
8)	Real time operating systems can be found i a) PDAS c) Cell phones	b)	Scientific instruments PDC
9)	Inter process communication <ul><li>a) is required for all processes</li><li>c) is never necessary</li></ul>	•	is usually done via disk drivers all processes to synchronize activity



10)	The initial value of semaphore that allows o section is a) 8 b) 1	nly on		oces d)	
11)	Semaphore a) Synchronise critical resources to prevent b) Are used to do I/O c) Are used for memory management d) None of above	,		u)	
12)	Round-robin scheduling a) Allows interactive task quicker access b) Is quite complex to implement c) Gives each task the same chance at t d) None of the above				
13)	The FIFO algorithm  a) Execute first the job that last entered th b) Execute first the job that first entered th c) Execute first the job that has been in th d) None of above	ne que	eue		
14)	Linux uses what mechanism to determine <ul><li>a) CPU controlled multitasking</li><li>c) Pre-emptive multitasking</li></ul>	b) (	process is run Co-operating mu None of above	ıltitas	king
15)	PCB = a) Programming Control Block c) Process Communication Block		Program Contro None of above	l Bloo	k
16)	NRE cost can be defined by  a) The one time monetary cost of designing b) Life time cost of system c) Depends upon embedded system d) None of above	ng the	system		
17)	In SPI slave select input used as a) SPI device as slave when SS active b) Clock must be synchronized c) SPI device as master when SS active d) None of above				
18)	In I2C high speed mode high speed is give a) 400 Kbps b) 800 Kbps		1600 Kbps	d)	None of above
19)	In embedded system, A cache provides a) overall increase in performance b) increase in execution time c) through put decreases d) none of above				
20)	AHB provides higher data through put than a) It is based on bidirectional bus design b) It is based on a centralized multiplexed c) It is based on unidirectional bus design d) None of the above	d bus s			

Seat	
No.	

# B.E. (E&TC) (Part – II) (Old) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data if required.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain embedded system design challenges.
- 2) Explain recent trends in embedded system.
- 3) Explain the concept of RTC in LPC2148.
- 4) Explain the concept of watchdog timer for LPC2148.
- 5) Explain concept of three stage pipe line of ARM 7 processor.
- 6) Explain Bus architecture in ARM 7.

3. Solve any two questions:

- 1) Draw and explain with block diagram architecture of LPC 2148.
- 2) What do you mean by design metric? Explain the following design metrics.
  - i) Power
- ii) Time to market
- iii) Safety
- iv) NRE cost
- Draw the block diagram interfacing of graphics LCD with ARM processor. Explain in details.



#### SECTION - II

#### 4. Solve any four questions:

 $(5 \times 4 = 20)$ 

- 1) Explain features of RTOS.
- 2) Explain concept of semaphore with example.
- 3) Difference between micro kernel and monolithic kernel architecture.
- 4) Explain thread vs processes.
- 5) Linux file system.

#### 5. Solve any two questions:

- 1) Explain the concepts of mailbox in IPC. What are the function associated of mailbox in micro cos II ? Explain in details with associated diagram.
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Explain the concept of multithreading using p threads. Explain syslog and strace debug technique used in linux.

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### B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 **BROADBAND COMMUNICATION**

Day and Date: Monday, 21-11-2016	Max. Marks: 100
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Time: 3.00 p.m. to 6.00 p.m.

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

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

	•	•	,
ı	MCQ/Objective Ty	pe Questions	
Duration: 30 Minutes	·		Marks: 20
1. Choose the correct alte	rnatives :		(20×1=20)
1) Hop by hop error an	d flow control is p	resent in	
a) Frame relay	•	b) Packet switching	ng
c) Cell relay		d) None	
2) Which of the following	ng is faster but un	reliable protocol?	
a) Frame relay		b) Packet switchir	ng
c) Circuit switching		d) Frame switchin	g
3) X.25 is standard for		,	
a) Frame relay		b) Packet switchir	ng
c) Cell relay		d) None	
4) ISDN relies on stand	dard voice data ra	te of	
a) 192 Kbps	b) 64 Kbps	c) 1.5 Mbps	d) 2 Mbps
5) ISDN uses	•	•	,
a) TDM-PCM	•		
6) ISDN uses	,	,	,
a) Inband signaling		b) Outband signali	ing
c) Common channe	el signaling	,	
7) Modulation-demodu		•	etwork usina
,	•	c) Digital switch	•

8)	Maximum capacity				-1\	O B Albara
	a) 192 Kbps	•		•	a)	2 IVIDPS
9)	The main data char					
	a) B channel	b) D channel	c)	H channel	d)	H0 channel
10)	Primary access me	eans				
	a) 23 B + 2 D	b) 23 B + 1D	c)	2B + D	d)	B + D
11)	B-ISDN uses	as PDU.				
	a) Frame	b) Packet	c)	Cell	d)	None
12)	B-ISDN uses	coding.				
	a) NRZ	b) RZ	c)	CMI	d)	None
13)	Broadcast TV chan	nel is an example	of_	S	ervi	ice.
	a) Interactive	b) Distribution	c)	Conversational	d)	Messaging
14)	Virtual path is made	e up of virtual				
	a) Circuits	b) Channels	c)	Cells	d)	Connections
15)	ATM cell is made u	p of				
	a) 48 bytes	b) 53 bytes	c)	64 bytes	d)	5 bytes
16)	AAL type 1 means					
	a) Connection orie	nted, constant bit i	rate	•		
	b) Connection orie	nted, variable bit ra	ate			
	c) Connectionless	, constant bit rate				
	d) Connectionless	, variable bit rate				
17)	ATM cells are route	ed using		field inside A	TM	l cell.
	a) GFC	b) HEC	c)	VPI-VCI	d)	Payload type
18)	GFC is required at _		int	erface.		
	a) Network to netw	ork ork	b)	User to network	(	
	c) User to user		d)	Network to use	r	
19)	Maximum number	of buffers are requ	ire	d in case of		
	a) Input buffers		b)	Output buffers		
	c) Crosspoint buffe	ers	d)	None		
20)	Output lines are les	s than input lines i	n c	ase of		_ATM network.
	a) Funnel type		b)	Shuffle exchang	ge	
	c) Extended matrix	<	d)	None		



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# B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 BROADBAND COMMUNICATION

Day and Date: Monday, 21-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

#### SECTION-I

2. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Explain packet switching along with datagram and virtual circuit approach.
- b) Write principles of ISDN.
- c) Draw ISDN connections on B and D channel.
- d) Draw and explain ISDN protocol architecture.
- e) Explain various channels used in ISDN.

3. Attempt any two:

 $(2 \times 10 = 20)$ 

- a) Along with proper diagram discuss I-series of recommendations.
- b) Explain user interface to ISDN.
- c) Explain with suitable figures data flow in case of packet switching and frame relay.

#### SECTION - II

4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Explain various interactive broadband services.
- b) Explain architecture of B-ISDN.
- c) Write a note on AAL services and protocols.
- d) Explain what are Virtual Paths (VP) and Virtual Channels (VC).
- e) Explain matrix type ATM switching element.

5. Attempt any two:

 $(2\times10=20)$ 

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- a) Explain in detail SONET system hierarchy.
- b) Explain along with flow chart call establishment using virtual paths.
- c) Compare output buffering with central buffering. Justify which one will be preferred.

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# B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 BROADBAND COMMUNICATION

Day and Date: Monday, 21-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

•	er MCQ/Objective	e type questions o n, Q.P. Set (P/Q/R/S	
MCG	)/Objective Type	Questions	
Duration: 30 Minutes			Marks : 20
1. Choose the correct alternati	ves:		(20×1=20)
1) AAL type 1 means			
<ul> <li>a) Connection oriented,</li> </ul>	constant bit rate		
b) Connection oriented,	variable bit rate		
c) Connectionless, cons	stant bit rate		
d) Connectionless, varia	able bit rate		
2) ATM cells are routed usi	ng	field inside ATM	1 cell.
a) GFC b) F	fEC c)	VPI-VCI d)	Payload type
3) GFC is required at	inte	erface.	
a) Network to network	b)	User to network	
c) User to user	d)	Network to user	
4) Maximum number of but	ffers are required	d in case of	
<ul><li>a) Input buffers</li></ul>	b)	Output buffers	
c) Crosspoint buffers	d)	None	
5) Output lines are less tha	n input lines in ca	ase of	_ ATM network.
a) Funnel type		Shuffle exchange	
c) Extended matrix	d)	None	
6) Hop by hop error and flo	w control is pres	ent in	
a) Frame relay	b)	Packet switching	
c) Cell relay	d)	None	P.T.O.



7)	Which of the follow a) Frame relay	ing is faster but un		able protocol? Packet switchin	ıa	
	c) Circuit switching	1	,	Frame switching	•	
8)	X.25 is standard for		-,		3	
-,	a) Frame relay		b)	Packet switchin	g	
	c) Cell relay			None	•	
9)	ISDN relies on stan	ndard voice data ra	te (	of		
	a) 192 Kbps	b) 64 Kbps	c)	1.5 Mbps	d)	2 Mbps
10)	ISDN uses	multiplexing ar	nd r	nodulation scher	ne.	
	a) TDM-PCM					
11)	ISDN uses					
	a) Inband signaling		b)	Outband signali	ng	
	c) Common chann	el signaling	d)	None		
12)	Modulation-demod	ulation is required	at e	every hop of a ne	two	ork using
	a) Bridge	b) Analog switch	c)	Digital switch	d)	Circuit switch
13)	Maximum capacity	with basic access	of	ISDN is		
	a) 192 Kbps	b) 64 Kbps	c)	1.5 Mbps	d)	2 Mbps
14)	The main data char					
	a) B channel	b) D channel	c)	H channel	d)	H0 channel
15)	Primary access me					
	a) 23 B + 2 D	·	c)	2B + D	d)	B + D
16)	B-ISDN uses					
	a) Frame		c)	Cell	d)	None
17)	B-ISDN uses					
	a) NRZ	·	•		•	None
18)	Broadcast TV chan	•				
	a) Interactive	•	c)	Conversational	d)	Messaging
19)	Virtual path is made	-				
	a) Circuits	·	c)	Cells	d)	Connections
20)	ATM cell is made u	-		0.4.1	ıv	
	a) 48 bytes	b) 53 bytes	C)	64 bytes	d)	5 bytes

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# B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 BROADBAND COMMUNICATION

Day and Date : Monday, 21-11-2016

Time: 3.00 p.m. to 6.00 p.m.

SECTION - I

2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) Explain packet switching along with datagram and virtual circuit approach.
- b) Write principles of ISDN.
- c) Draw ISDN connections on B and D channel.
- d) Draw and explain ISDN protocol architecture.
- e) Explain various channels used in ISDN.

3. Attempt any two:

 $(2 \times 10 = 20)$ 

- a) Along with proper diagram discuss I-series of recommendations.
- b) Explain user interface to ISDN.
- c) Explain with suitable figures data flow in case of packet switching and frame relay.

#### SECTION - II

4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Explain various interactive broadband services.
- b) Explain architecture of B-ISDN.
- c) Write a note on AAL services and protocols.
- d) Explain what are Virtual Paths (VP) and Virtual Channels (VC).
- e) Explain matrix type ATM switching element.

5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain in detail SONET system hierarchy.
- b) Explain along with flow chart call establishment using virtual paths.
- c) Compare output buffering with central buffering. Justify which one will be preferred.

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# B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 BROADBAND COMMUNICATION

Day and Date: Monday, 21-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

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

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Dur	atio	n : 30 Minutes	MCQ	/Objective Ty	pe	Questions		Marks : 20
Dui	ano	ii. oo wiiilatoo						Marko . 20
1.	Ch	oose the correct alte	ernativ	ves:				(20×1=20)
	1)	B-ISDN uses		as PDU.				
		a) Frame	b) P	acket	c)	Cell	d)	None
	2)	B-ISDN uses		coding.				
		a) NRZ	b) R	Z	c)	CMI	d)	None
	3)	Broadcast TV chan	nel is	an example o	of _	S	ervi	ce.
		a) Interactive	b) D	istribution	c)	Conversational	d)	Messaging
	4)	Virtual path is made	e up c	of virtual				
		a) Circuits	b) C	hannels	c)	Cells	d)	Connections
	5)	ATM cell is made u	p of					
		a) 48 bytes	b) 53	3 bytes	c)	64 bytes	d)	5 bytes
	6)	AAL type 1 means						
		a) Connection orie	nted,	constant bit ra	ate			
		b) Connection orie	nted,	variable bit ra	te			
		c) Connectionless	, cons	stant bit rate				
		d) Connectionless	, varia	able bit rate				
	7)	ATM cells are route	ed usir	ng		field inside A	TM	l cell.
		a) GFC	b) H	EC	c)	VPI-VCI	d)	Payload type

8)	GFC is required at _					
	a) Network to netw	vork	,	User to network		
	c) User to user		d)	Network to use	r	
9)	Maximum number of	•				
	a) Input buffers			Output buffers		
	c) Crosspoint buffe		•	None		
10)	Output lines are les	s than input lines i				_ ATM network.
	a) Funnel type		•	Shuffle exchang	ge	
	c) Extended matrix	(	d)	None		
11)	Hop by hop error ar	nd flow control is p	res	ent in		
	a) Frame relay		•	Packet switchin	ıg	
	c) Cell relay		,	None		
12)	Which of the following	ing is faster but un		-		
	a) Frame relay		•	Packet switchin	•	
	c) Circuit switching		d)	Frame switching	g	
13)	X.25 is standard for	r				
	a) Frame relay			Packet switchin	ıg	
	c) Cell relay		,	None		
14)	ISDN relies on stan					
	a) 192 Kbps					
15)	ISDN uses	-				
	a) TDM-PCM	b) FDM-AM	c)	TDM-AM	d)	FDM-PCM
16)	ISDN uses					
	a) Inband signaling			Outband signali	ng	
	c) Common channe		•	None		
17)				•		_
	a) Bridge	b) Analog switch	c)	Digital switch	d)	Circuit switch
18)	Maximum capacity		of	ISDN is		
	a) 192 Kbps	b) 64 Kbps	c)	1.5 Mbps	d)	2 Mbps
19)	The main data char	-				
	a) B channel	b) D channel	c)	H channel	d)	H0 channel
20)	Primary access me					
	a) 23 B + 2 D	b) 23 B + 1D	c)	2B + D	d)	B + D



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# B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 BROADBAND COMMUNICATION

Day and Date: Monday, 21-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

#### SECTION-I

2. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Explain packet switching along with datagram and virtual circuit approach.
- b) Write principles of ISDN.
- c) Draw ISDN connections on B and D channel.
- d) Draw and explain ISDN protocol architecture.
- e) Explain various channels used in ISDN.

3. Attempt any two:

 $(2 \times 10 = 20)$ 

- a) Along with proper diagram discuss I-series of recommendations.
- b) Explain user interface to ISDN.
- c) Explain with suitable figures data flow in case of packet switching and frame relay.

#### SECTION - II

4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Explain various interactive broadband services.
- b) Explain architecture of B-ISDN.
- c) Write a note on AAL services and protocols.
- d) Explain what are Virtual Paths (VP) and Virtual Channels (VC).
- e) Explain matrix type ATM switching element.

5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain in detail SONET system hierarchy.
- b) Explain along with flow chart call establishment using virtual paths.
- c) Compare output buffering with central buffering. Justify which one will be preferred.

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a) Interactive

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B.E.	•	Examination	_	ing) Part – II (New) I
-	d Date : Monday, 21 3.00 p.m. to 6.00 p.			Max. Marks: 100
1	m o 2) <b>A</b>	ninutes in Answer I ne mark. nswer MCQ/Obje	Book Page No. 3. E	e solved in first 30 ach question carries ns on Page No. 3 only. A/R/S) on Top of Page.
		MCQ/Objective T	ype Questions	
Duratio	n : 30 Minutes			Marks : 20
1. Ch	oose the correct alte	ernatives :		(20×1=20)
1)	ISDN uses			
	a) Inband signaling	)	b) Outband signa	aling
	c) Common chann	el signaling	d) None	
2)	Modulation-demod	lulation is required	at every hop of a n	etwork using
	a) Bridge	b) Analog switch	c) Digital switch	d) Circuit switch
3)	Maximum capacity	with basic access	s of ISDN is	
	a) 192 Kbps	b) 64 Kbps	c) 1.5 Mbps	d) 2 Mbps
4)	The main data cha	nnel for ordinary IS	SDN user is	
	a) B channel	b) D channel	c) H channel	d) H0 channel
5)	Primary access me	eans		
	a) 23 B + 2 D		c) 2B + D	d) B + D
6)	B-ISDN uses			
	a) Frame	•	c) Cell	d) None
7)	B-ISDN uses			
	a) NRZ			d) None
8)	Broadcast TV chan	inel is an example	of	service.

b) Distribution c) Conversational d) Messaging

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# B.E. (Electronics and Telecommunication Engineering) Part – II (New) Examination, 2016 BROADBAND COMMUNICATION

Day and Date: Monday, 21-11-2016

Time: 3.00 p.m. to 6.00 p.m.

#### SECTION-I

2. Attempt any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) Explain packet switching along with datagram and virtual circuit approach.
- b) Write principles of ISDN.
- c) Draw ISDN connections on B and D channel.
- d) Draw and explain ISDN protocol architecture.
- e) Explain various channels used in ISDN.

3. Attempt any two:

 $(2 \times 10 = 20)$ 

- a) Along with proper diagram discuss I-series of recommendations.
- b) Explain user interface to ISDN.
- c) Explain with suitable figures data flow in case of packet switching and frame relay.

#### SECTION - II

4. Attempt any four:

 $(4 \times 5 = 20)$ 

- a) Explain various interactive broadband services.
- b) Explain architecture of B-ISDN.
- c) Write a note on AAL services and protocols.
- d) Explain what are Virtual Paths (VP) and Virtual Channels (VC).
- e) Explain matrix type ATM switching element.

5. Attempt any two:

 $(2\times10=20)$ 

- a) Explain in detail SONET system hierarchy.
- b) Explain along with flow chart call establishment using virtual paths.
- c) Compare output buffering with central buffering. Justify which one will be preferred.

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# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

	2) Answer MCQ/Obj	•	Vo. 3 only.
Duration : 30 Minutes	MCQ/Objective	e Type Questions	Marks : 20
Choose the correct	t angwar :		
		out because the sensor is	(20×1=20)
a) Electric		c) Mechanical d) Optical	
,	the laser beam not ref	, , .	
a) From a flat		b) From a pit	
c) From a lan	d	d) From a glass	
3) What is the nu	mber of fields per seco	ond in India ?	
a) 25	b) 50	c) 625 d) 15625	
4) Chroma signa	requires	detector in receiver.	
a) Envelope		b) Balanced	
c) Ratio		d) Foster selley discriminator	
5) is	s not used in T.V. Rece	eiver	
a) Cathode ra	y tube	b) Loudspeaker	
,	itive semiconductor	, •	
•	•	ole is ohm.	
a) 100	b) 73	c) 36.5 d) 300	
,	s not an F.M. detector		
a) PLL detect		b) Phase shift discriminator	
c) Ratio Dete	ctor	d) Envelope detector	



8)	Horizontal trace is scanning takes		microseconds.			ls.
	a) 52	b) 60	c)	63.5	d)	64
9)	Which of the following	ng working is like w	orki	ng of disc recor	din	g unit?
	a) Motor	b) Dynamo	c)	Microphone	d)	Generator
10)	The value of kell fac	tor is about				
	a) 0.3	b) 0.5	c)	0.7	d)	0.9
11)	Moving Picture Expe	erts Group (MPEG)	is u	sed to compres	S	
	a) Frames	b) Images	c)	Audio	d)	Video
12)	A combination of en	cryption algorithm a	nd	a decryption alg	jori	thm is called a
	a) plain text	b) cipher	c)	original text	d)	shift cipher
13)	The most common of audio is based on po				rea	ate CD-quality
	a) Predictive Encode	ding	b)	Perceptual En	cod	ling
	c) MPEG		d)	JPEG		
14)	Audio and Video con elements or	npression, each fram	ne is	s divided into sm	all (	grids, called picture
	a) Frame	b) Packets	c)	Pixels	d)	Mega pixels
15)	is a sta talk to computers co	ndard to allow telep nnected to the Interr		•	tel	ephone network to
	a) SIP		b)	H.323		
	c) Q.991		d)	None of the ab	ove	)
16)	When there is more t	than one source, the	)	ident	ifie	r defines the mixer.
	a) Synchronization	source	b)	Contributor		
	c) Time stamp		d)	None of the ab	ove	)
17)	is the p	rotocol designed to	ha	ndle real time tra	affic	on the Internet.
	a) TCP	b) UDP	c)	RTP	d)	None of the above
18)	The real time video o sites.	conference, data fro	m tl	ne server is		to the client
	a) unicast	b) multicast	c)	broadcast	d)	none of the above
19)	Real time traffic need	ds the support of				
	a) broadcasting	b) multicasting	c)	both a) and b)	d)	none of the above
20)	means	combining several	stre	ams of traffic in	to c	one stream.
	a) Translation	b) Mixing	c)	Both a) and b)	d)	None of the above



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# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Figure to **right** indicate **full** marks.

#### SECTION - I

2. Attempt any four. (5×4 =20)

- 1) Explain the term kell factor and aspect ratio.
- 2) What is interlaced scanning? What are its advantages?
- 3) With block diagram explain working of disc reproduction system.
- 4) Explain block diagram of RF tuner section.
- 5) Explain HDTV.

### 3. Attempt any two: (10×2 = 20)

- 1) Draw a block diagram of an NTSC Colour T.V. Transmitter and describe each block.
- 2) What do you understand by compatibility in T.V. systems? What conditions must be fulfilled for sake of compatibility?
- 3) Explain how sound is reproduced from C.D.

## 

#### SECTION - II

4. Attempt any four. (5×4 = 20)

- 1) What are types of multipoint conferencing? Explain any one type in brief.
- 2) Explain PCM speech technique.
- 3) Explain Broadcast T.V.
- 4) What are audio applications of multimedia?
- 5) Define multimedia and explain elements of multimedia.

5. Attempt any two: (10×2 = 20)

- 1) Explain Telephone network in detail.
- 2) What are different video compression techniques? Compare between them.
- 3) Explain entertainment applications of multimedia.

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# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) All questions are compulsory.
- 4) Figure to right indicate full marks.

		MCQ/Objective T	vpe Questions		
Duratio	on : 30 Minutes		,,,	Marks : 20	
1. Ch	noose the correct ans	swer:		(20×1=20)	
1)	) When there is more	than one source, the	e ident	tifier defines the mixer.	
	a) Synchronization	n source	b) Contributor		
	c) Time stamp		d) None of the ab	oove	
2)	) is the	protocol designed to	handle real time tr	affic on the Internet.	
	a) TCP	b) UDP	c) RTP	d) None of the above	
3)	The real time video sites.	,	•	to the client	
	a) unicast	b) multicast	c) broadcast	d) none of the above	
4)	Real time traffic ne	eds the support of			
	a) broadcasting	b) multicasting	c) both a) and b)	d) none of the above	
5)	) mean	s combining several	streams of traffic into one stream.		
	a) Translation	b) Mixing	c) Both a) and b)	d) None of the above	
6)	) Compact disc surfa	ace doesn't wear out	because the senso	or is	
	a) Electric	b) Magnetic	c) Mechanical	d) Optical	
7)	From where is the	laser beam not refle	cted in video disc?		
	a) From a flat		b) From a pit		
	c) From a land		d) From a glass		



8)	What is the number	of fields per secon	nd in I	ndia ?		
	a) 25	b) 50	c)	625	d) 15625	
9)	Chroma signal requ	ires	detect	or in receiver.		
	a) Envelope		b)	Balanced		
	c) Ratio		d)	Foster selley of	liscriminator	
10)	is not u	used in T.V. Rece	iver			
	a) Cathode ray tube	Э	b)	Loudspeaker		
	c) Photosensitive s	emiconductor	d)	Integrated circ	uit	
11)	Radiation resistance	e of half wave dipo	ole is <sub>-</sub>		ohm.	
	a) 100	b) 73	c)	36.5	d) 300	
12)	The following is not	an F.M. detector				
	a) PLL detector		b)	Phase shift dis	criminator	
	c) Ratio Detector		d)	Envelope dete	ctor	
13)	Horizontal trace is s	canning takes		microsec	onds.	
	a) 52	b) 60	c)	63.5	d) 64	
14)	Which of the following working is like working of disc recording unit?					
	a) Motor	b) Dynamo	c)	Microphone	d) Generator	
15)	The value of kell fac	tor is about				
	a) 0.3	,	,	0.7	d) 0.9	
16)	Moving Picture Expe	erts Group (MPEG	a) is us	sed to compres	S	
	a) Frames	b) Images	,		,	
17)	A combination of en			• • • • • • • • • • • • • • • • • • • •		
\	a) plain text	, ·	,	•	•	
18)	The most common compression technique that is used to create CD-quality audio is based on perceptual encoding technique is called					
	a) Predictive Encode	ding	b)	Perceptual En	coding	
	c) MPEG		d)	JPEG		
19)	Audio and Video con elements or	npression, each fra	ame is	divided into sm	nall grids, called picture	
	a) Frame	b) Packets	c)	Pixels	d) Mega pixels	
20)				es on the public	telephone network to	
	talk to computers co	nnected to the inte		11,000		
	a) SIP		,	H.323		
	c) Q.991		d)	None of the ab	oove	
					_	



Seat	
No.	

# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Figure to **right** indicate **full** marks.

#### SECTION - I

2. Attempt any four. (5×4 =20)

- 1) Explain the term kell factor and aspect ratio.
- 2) What is interlaced scanning? What are its advantages?
- 3) With block diagram explain working of disc reproduction system.
- 4) Explain block diagram of RF tuner section.
- 5) Explain HDTV.
- 3. Attempt any two: (10×2 = 20)
  - 1) Draw a block diagram of an NTSC Colour T.V. Transmitter and describe each block.
  - 2) What do you understand by compatibility in T.V. systems? What conditions must be fulfilled for sake of compatibility?
  - 3) Explain how sound is reproduced from C.D.

# SECTION - II

4. Attempt any four. (5×4 = 20)

- 1) What are types of multipoint conferencing? Explain any one type in brief.
- 2) Explain PCM speech technique.
- 3) Explain Broadcast T.V.
- 4) What are audio applications of multimedia?
- 5) Define multimedia and explain elements of multimedia.

5. Attempt any two: (10×2 = 20)

- 1) Explain Telephone network in detail.
- 2) What are different video compression techniques? Compare between them.
- 3) Explain entertainment applications of multimedia.


Seat	_	
No.	Set	R

# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016	Max. Marks: 10

Time: 3.00 p.m. to 6.00 p.m.

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

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

			<ul><li>3) All questions (</li><li>4) Figure to right</li></ul>	-	-	,	•
Dur	atior	า : 30 Minutes	MCQ/Obje	ctive Type	Question	s	Marks : 20
1.	Cho	oose the corre	ct answer :				(20×1=20)
	1)	Moving Pictur	e Experts Group (N	/IPEG) is u	sed to com	press	
		a) Frames	b) Images	c)	Audio	d) Video	
	2)	A combination	n of encryption algo	orithm and	a decryptic	on algorithm is calle	ed a
		a) plain text	b) cipher	c)	original te	xt d) shift ciphe	er
	3)		nmon compression d on perceptual en	•		•	ality
		a) Predictive	Encoding	b)	Perceptua	al Encoding	
		c) MPEG		d)	JPEG		
	4)	Audio and Vid elements or	eo compression, ea	ach frame is	divided int	o small grids, calle	d picture
		a) Frame	b) Packets	c)	Pixels	d) Mega pix	els
	5)		s a standard to allo ters connected to th		es on the p	oublic telephone ne	twork to
		a) SIP		b)	H.323		
		c) Q.991		d)	None of th	ne above	
	6)	When there is	more than one sou	rce, the		identifier defines th	e mixer.
		a) Synchroni	zation source	b)	Contributo	or	
		c) Time stam	ıp	d)	None of th	ne above	



7)	is the p	rotocol designed to	ha	ndle real time tra	affic	on the Internet.
	a) TCP	b) UDP	c)	RTP	d)	None of the above
8)	The real time video o sites.	onference, data fror	n th	ne server is		to the client
	a) unicast	b) multicast	c)	broadcast	d)	none of the above
9)	Real time traffic need	ds the support of				
	a) broadcasting	b) multicasting	c)	both a) and b)	d)	none of the above
10)	means	combining several s	stre	ams of traffic in	to o	ne stream.
	a) Translation	b) Mixing	c)	Both a) and b)	d)	None of the above
11)	Compact disc surfac	e doesn't wear out l	oec	ause the senso	r is	
	a) Electric	b) Magnetic	c)	Mechanical	d)	Optical
12)	From where is the la	ser beam not reflec	ted	in video disc?		
	a) From a flat		b)	From a pit		
	c) From a land		d)	From a glass		
13)	What is the number	of fields per second	in l	India ?		
	a) 25	b) 50	c)	625	d)	15625
14)	Chroma signal requi	res de	tec	tor in receiver.		
	a) Envelope		b)	Balanced		
	c) Ratio		d)	Foster selley d	iscr	iminator
15)	is not u	ised in T.V. Receive	er			
	a) Cathode ray tube	)	b)	Loudspeaker		
	c) Photosensitive se	emiconductor	d)	Integrated circu	uit	
16)	Radiation resistance	of half wave dipole	is	c	hm	
	a) 100	b) 73	c)	36.5	d)	300
17)	The following is not a	an F.M. detector				
	a) PLL detector		b)	Phase shift dis	crin	ninator
	c) Ratio Detector		d)	Envelope dete	ctor	
18)	Horizontal trace is so	canning takes		microseco	ond	S.
	a) 52	b) 60	c)	63.5	d)	64
19)	Which of the following	ng working is like wo	orki	ng of disc recor	din	g unit ?
	a) Motor	b) Dynamo	c)	Microphone	d)	Generator
20)	The value of kell fact	tor is about				
	a) 0.3	b) 0.5	c)	0.7	d)	0.9



Seat	
No.	

# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Figure to **right** indicate **full** marks.

#### SECTION - I

#### 2. Attempt any four.

 $(5 \times 4 = 20)$ 

- 1) Explain the term kell factor and aspect ratio.
- 2) What is interlaced scanning? What are its advantages?
- 3) With block diagram explain working of disc reproduction system.
- 4) Explain block diagram of RF tuner section.
- 5) Explain HDTV.

#### 3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) Draw a block diagram of an NTSC Colour T.V. Transmitter and describe each block.
- 2) What do you understand by compatibility in T.V. systems? What conditions must be fulfilled for sake of compatibility?
- 3) Explain how sound is reproduced from C.D.

#### SECTION - II

4. Attempt any four. (5×4 = 20)

- 1) What are types of multipoint conferencing? Explain any one type in brief.
- 2) Explain PCM speech technique.
- 3) Explain Broadcast T.V.
- 4) What are audio applications of multimedia?
- 5) Define multimedia and explain elements of multimedia.

5. Attempt any two: (10×2 = 20)

- 1) Explain Telephone network in detail.
- 2) What are different video compression techniques? Compare between them.
- 3) Explain entertainment applications of multimedia.


Seat	
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Set S

# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

	2) Ar Do 3) Al	swer Book Page Nonswer MCQ/Object on 't forget to mentions are compute to right indicated.	ive on pu	type question , Q.P. Set (P/Q/ llsory.	s on Page No	. 3 only.
<b>.</b> .:	00.14"	MCQ/Objective Ty	pe	Questions		
Duration	n : 30 Minutes					Marks : 20
1. Cho	oose the correct answ	er:				(20×1=20)
1)	Radiation resistance	of half wave dipole	is	o	hm.	
	a) 100	b) 73	c)	36.5	d) 300	
2)	The following is not a	ın F.M. detector				
	a) PLL detector		b)	Phase shift dis	criminator	
	c) Ratio Detector		,	Envelope detec		
3)	Horizontal trace is so	anning takes		microseco	onds.	
	a) 52	b) 60	c)	63.5	d) 64	
4)	Which of the followin	g working is like wo	rki	ng of disc recor	ding unit?	
	a) Motor	b) Dynamo	c)	Microphone	d) Generator	
5)	The value of kell fact	or is about				
	a) 0.3	•	•	0.7	d) 0.9	
6)	Moving Picture Expe	,		•	3	
	a) Frames	,	,	Audio	d) Video	
7)	A combination of end					
	a) plain text	b) cipher	,	original text	, .	
8)	The most common co audio is based on pe				reate CD-quali	ty
	a) Predictive Encod	ing	b)	Perceptual End	coding	
	c) MPEG		d)	JPEG		



9)	Audio and Video c elements or	ompression, each fra	ame is	divided into sm	all (	grids, called picture
	a) Frame	b) Packets	c)	Pixels	d)	Mega pixels
10)		standard to allow tele	•	es on the public	tel:	ephone network to
	talk to computers	connected to the Inte	ernet.			
	a) SIP		b)	H.323		
	c) Q.991		d)	None of the ab	ove	)
11)	When there is mor	e than one source, th	ne	ident	ifieı	r defines the mixer.
	a) Synchronization	on source	b)	Contributor		
	c) Time stamp		d)	None of the ab	ove	)
12)	is the	e protocol designed t	to har	ndle real time tra	affic	on the Internet.
	a) TCP	b) UDP	c)	RTP	d)	None of the above
13)	The real time vide sites.	o conference, data fr	om th	e server is		to the client
	a) unicast	b) multicast	c)	broadcast	d)	none of the above
14)	Real time traffic ne	eeds the support of				
	a) broadcasting	b) multicasting	c)	both a) and b)	d)	none of the above
15)	mea	ns combining severa	al stre	ams of traffic in	to c	one stream.
	a) Translation	b) Mixing	c)	Both a) and b)	d)	None of the above
16)	Compact disc surf	face doesn't wear ou	ıt bec	ause the senso	r is	
	a) Electric	b) Magnetic	c)	Mechanical	d)	Optical
17)	From where is the	laser beam not refle	ected	in video disc?		
	a) From a flat		b)	From a pit		
	c) From a land		d)	From a glass		
18)	What is the number	er of fields per secon	nd in I	ndia ?		
	a) 25	b) 50	c)	625	d)	15625
19)	Chroma signal red	quires c	detect	or in receiver.		
	a) Envelope		b)	Balanced		
	c) Ratio		d)	Foster selley d	iscı	riminator
20)	,	ot used in T.V. Recei	,	ĺ		
,	a) Cathode ray tu			Loudspeaker		
	,	semiconductor	,	Integrated circu	ıit	
	o, i notosensitive	, somioonductor	u)	integrated circl	ait.	



Seat	
No.	

# B.E. (Electronics and Telecommunication Engineering) (Part – II) (New) Examination, 2016 MULTIMEDIA COMMUNICATION TECHNIQUES

Day and Date: Tuesday, 22-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Figure to **right** indicate **full** marks.

#### SECTION - I

2. Attempt any four. (5×4 =20)

- 1) Explain the term kell factor and aspect ratio.
- 2) What is interlaced scanning? What are its advantages?
- 3) With block diagram explain working of disc reproduction system.
- 4) Explain block diagram of RF tuner section.
- 5) Explain HDTV.

#### 3. Attempt any two: (10×2 = 20)

- 1) Draw a block diagram of an NTSC Colour T.V. Transmitter and describe each block.
- 2) What do you understand by compatibility in T.V. systems? What conditions must be fulfilled for sake of compatibility?
- 3) Explain how sound is reproduced from C.D.

# 

#### SECTION - II

4. Attempt any four. (5×4 = 20)

- 1) What are types of multipoint conferencing? Explain any one type in brief.
- 2) Explain PCM speech technique.
- 3) Explain Broadcast T.V.
- 4) What are audio applications of multimedia?
- 5) Define multimedia and explain elements of multimedia.

5. Attempt any two: (10×2 = 20)

- 1) Explain Telephone network in detail.
- 2) What are different video compression techniques? Compare between them.
- 3) Explain entertainment applications of multimedia.

c)  $0 \times 23$  and  $0 \times 02$ 

# **SLR-EP - 159**

Seat		
No.	Set	D
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	B.I	E. (E & TC	C) (Part – I EMBEDD			nation,	, 2016	
-	d Date : Wednes 3.00 p.m. to 6.00	-	2016				-	Total Marks : 100
	Instructions :	Answe 2) Answe forget 3) Assum	er Book Pag	e No. 3. i iective ty n, Q.P. So lata if rec	Each que /pe ques: et (P/Q/R. quired.	stion ca tions or	rries <b>one</b> n n <b>Page No</b> .	. 3 only. Don't
		MC	CQ/Objecti	ve Type	Questio	ns		
Duratio	n : 30 Minutes							Marks : 20
1. Ch	oose the correc	ct alternativ	ve:					(20×1=20)
				SECTIO	N – I			
ŕ	Philips ARM M a) 60 MHz ope b) 48 MHz ope c) 60 MHz ope d) 60 MHz ope Using USB up	eration, 0.18 eration, 0.18 eration, 0.18 eration, 0.18 to	8 -mm CMC 8 -mm CMC 3 -mm CMC 3 - mm but r devices	OS embed OS embed no embed may be	dded fast dded fast dded fast connecte	flash flash flash	-	ontroller.
Ź	<ul><li>a) 2</li><li>Condition test f</li><li>a) GT (greated</li><li>b) GT (greated</li><li>c) GT (greated</li><li>d) GT (greated</li></ul>	or r than) mea r than) mea r than) mea r than) mea	ns V and Z : ns N= V and ns Z = 0	= 0 = 0 d Z = 0	127		d) 256	
4)	In case of LPC a) Same repet c) Depends up	tition rate pon design	·	b) d)	Different None of	above		
5)	the cpsr. a) Supervisor	b)	System	c)	Undefine		ull read-wri d) Abort	te access to
6)	The ARM regis a) R 12		is called R 13		ster. R 14		d) R 15	
7)	In ARM a) Reset c) System	exce	ption is havi	b)	st priority. Supervis Interrupt	or	t	
8)	If External frequency VPBDIV values a) 0 × 23 and	s are	MHz, CCLK		z and PCL 0 × 23 ar			PLLCFG and

d)  $0 \times 22$  and  $0 \times 00$ 



9)	On interrupt, processor does the following a) Copies CPSR to SPSR mode c) Copies PC to R12 mode		Copies SPSR to Ione of above	CPSR mode	
10)	$r2 = 0 \times 0000 \ 0002, \ r4 = 0 \times 0000 \ 0001$	•			
	LSL r2, r4 results a) $r2 = 0 \times 0000\ 0004$ , $r4 = 0 \times 0000\ 0001$ c) $r2 = 0 \times 0000\ 0001$ , $r2 = 0 \times 0000\ 0002$			$04, r4 = 0 \times 0000 \ 000$	02
	SECTION	N – II			
11)	Scheduling is  a) Allowing jobs to use the processor b) Un related to performance consideration c) The same regardless of purpose of sys d) None of the above				
ŕ	Memory management is a) not used in modern operating system b) replaced with virtual memory on current c) not used in multiprogramming system d) none of above	nt syste	ems		
13)	Process is a) Program in high level language kept on b) Content of main memory c) A program in execution d) A job in secondary memory	disk			
14)	<ul> <li>Which of the following option is not true?</li> <li>a) A signal is boolean notification</li> <li>b) A signal and semaphore are of one bit e</li> <li>c) A signal and mutex are of one bit each</li> <li>d) A signal, a semaphore and a message a</li> </ul>		one bit each		
15)	Medical devices often run aa) Real time c) Multi user	b) S	ating system. Single user Jetwork		
16)	Event flags are used when  a) Task need to synchronise with the occub  b) Task need to synchronise with the occub  c) Interprocess communication required  d) None of above				
17)	Real time operating systems can be found i a) PDAS c) Cell phones		Scientific instrun	nents	
18)	Round-robin scheduling a) Allows interactive task quicker access to list quite complex to implement c) Gives each task the same chance at the list of the above				
19)	Inter task communication can be done to a) Mailbox b) Queue	_	jh Pipes	d) All of above	
20)	Semaphore a) Synchronise critical resources to prevent b) Are used to do I/O c) Are used for memory management d) None of shows	ent dea	ad lock		
	d) None of above				Set P

Seat	
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No.	

#### B.E. (E & TC) (Part – II) (New) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

**Instructions**: 1) Assume suitable data if **required**.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain recent trends in embedded system.
- 2) Explain the controller area network.
- 3) Explain the features of LPC2148.
- 4) Explain communication protocol I2C bus.
- 5) Explain the concept of PLL in LPC2148.
- 3. Solve any two questions.

 $(10 \times 2 = 20)$ 

- 1) Explain exceptions, interrupt and vector table for ARM processor. What is TCM?
- 2) Describe operation with example of following ARM instructions.
  - a) LDRB
  - b) CMN
  - c) LSL
  - d) MLA
  - e) BX
- 3) Draw and explain the data flow model of ARM core.

Set P



#### SECTION - II

4. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain application of RTOS.
- 2) Explain Kernel Services in an Operating System (RTOS).
- 3) Explain Kernel structure of  $\mu$  cos II RTOS.
- 4) Draw and explain the block diagram of Mobile Phone.
- 5) Draw and explain block diagram of interfacing LED with ARM processor with program.
- 5. Solve **any two** questions.

 $(10 \times 2 = 20)$ 

- 1) Explain the following Kernel objects in RTOS.
  - a) Semaphore
  - b) Message Queue
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Draw interfacing diagram of 16 × 2 LCD with LPC2148. Write an embedded C program to display "Embedded Systems" message on 16 × 2 LCD.

Seat	_	
No.	Set	C
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B.E. (E & TC) (Part – II) (N EMBEDDED	•
Day and Date: Wednesday, 23-11-2016 Time: 3.00 p.m. to 6.00 p.m.	Total Marks : 100
Answer Book Page No 2) <b>Answer MCQ/Objecti</b>	<u>•</u>
MCQ/Objective T	
Duration : 30 Minutes	Marks : 20
Choose the correct alternative :	(20×1=20)
SEC	CTION – I
In ARM exception is having hit a) Reset     c) System	ghest priority. b) Supervisor d) Interrupt Request
<ul> <li>2) If External frequency = 12 MHz, CCLK= 48 VPBDIV values are</li> <li>a) 0 × 23 and 0 × 01</li> <li>c) 0 × 23 and 0 × 02</li> </ul>	MHz and PCLK = 24 MHz then PLLCFG and b) $0 \times 23$ and $0 \times 00$ d) $0 \times 22$ and $0 \times 00$
<ul><li>3) On interrupt, processor does the following</li><li>a) Copies CPSR to SPSR mode</li><li>c) Copies PC to R12 mode</li></ul>	b) Copies SPSR to CPSR mode d) None of above
c) $r2 = 0 \times 0000\ 0001$ , $r2 = 0 \times 0000\ 0002$	•
5) mode is a special version of us the cpsr. a) Supervisor b) System	ser mode that allows full read-write access to c) Undefined d) Abort
6) The ARM register is called link a) R 12 b) R 13	register. c) R 14 d) R 15
<ul> <li>7) Condition test for</li> <li>a) GT (greater than) means N and Z = 0</li> <li>b) GT (greater than) means V and Z = 0</li> <li>c) GT (greater than) means N= V and Z =</li> <li>d) GT (greater than) means Z = 0</li> </ul>	0
8) In case of LPC2148, all PWM output will or	ocurs at

a) Same repetition rate

c) Depends upon design

b) Different repetition rate d) None of above



9)	Philips ARM MCU LPC21xx has a) 60 MHz operation, 0.18 -mm CMOS er b) 48 MHz operation, 0.18 -mm CMOS er c) 60 MHz operation, 0.13 -mm CMOS er d) 60 MHz operation, 0.13 - mm but no er	mbedded fast flash mbedded fast flash	
10)	using USB up to devices may a) 2 b) 64	c) 127	single host controller. d) 256
	SECTIO	N – II	
ŕ	Real time operating systems can be found a) PDAS c) Cell phones	in b) Scientific instru d) PDC	ments
12)	Round-robin scheduling a) Allows interactive task quicker access b) Is quite complex to implement c) Gives each task the same chance at th d) None of the above		
13)	Inter task communication can be done t	hrough	
	a) Mailbox b) Queue	c) Pipes	d) All of above
14)	Semaphore a) Synchronise critical resources to preve b) Are used to do I/O c) Are used for memory management d) None of above	ent dead lock	
15)	Medical devices often run aa) Real time c) Multi user	operating system. b) Single user d) Network	
16)	Event flags are used when  a) Task need to synchronise with the occ b) Task need to synchronise with the occ c) Interprocess communication required d) None of above		
17)	Process is a) Program in high level language kept on b) Content of main memory c) A program in execution d) A job in secondary memory	disk	
·	<ul> <li>Which of the following option is not true?</li> <li>a) A signal is boolean notification</li> <li>b) A signal and semaphore are of one bit of</li> <li>c) A signal and mutex are of one bit each</li> <li>d) A signal, a semaphore and a message</li> </ul>		
	Scheduling is a) Allowing jobs to use the processor b) Unrelated to performance consideration c) The same regardless of purpose of sys d) None of the above		
20)	Memory management is  a) not used in modern operating system b) replaced with virtual memory on currer c) not used in multiprogramming system d) none of above	nt systems	



Seat	
No.	

#### B.E. (E & TC) (Part – II) (New) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

**Instructions**: 1) Assume suitable data if **required**.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain recent trends in embedded system.
- 2) Explain the controller area network.
- 3) Explain the features of LPC2148.
- 4) Explain communication protocol I2C bus.
- 5) Explain the concept of PLL in LPC2148.
- 3. Solve any two questions.

 $(10 \times 2 = 20)$ 

- 1) Explain exceptions, interrupt and vector table for ARM processor. What is TCM?
- 2) Describe operation with example of following ARM instructions.
  - a) LDRB
  - b) CMN
  - c) LSL
  - d) MLA
  - e) BX
- 3) Draw and explain the data flow model of ARM core.

Set Q

## 

#### SECTION - II

4. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain application of RTOS.
- 2) Explain Kernel Services in an Operating System (RTOS).
- 3) Explain Kernel structure of  $\mu$  cos II RTOS.
- 4) Draw and explain the block diagram of Mobile Phone.
- 5) Draw and explain block diagram of interfacing LED with ARM processor with program.
- 5. Solve **any two** questions.

 $(10 \times 2 = 20)$ 

- 1) Explain the following Kernel objects in RTOS.
  - a) Semaphore
  - b) Message Queue
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Draw interfacing diagram of  $16 \times 2$  LCD with LPC2148. Write an embedded C program to display "Embedded Systems" message on  $16 \times 2$  LCD.

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	B.E	E. (E & T	C) (Part – EMBED	, .	•	ation, 2016	
•	Date : Wedneso 3.00 p.m. to 6.00	•	-2016				Total Marks : 100
	Instructions :	Answ 2) Answ forge 3) Assur	er Book Pag v <b>er MCQ/O</b> k	ge No. <b>3</b> pjective n, Q.P. data if <b>re</b>	. <b>Each</b> quest type questic Set (P/Q/R/S equired.	ion carries <b>or</b>	No. 3 only. Don't
		M	CQ/Object	ive Typ	e Question	s	
Duratio	n: 30 Minutes						Marks : 20
1. Ch	oose the correc	t alternati	ive:				(20×1=20)
				SECTI	I – NC		
1)	the cpsr.						
۵)	a) Supervisor					d) Abo	ort
2)	The ARM regist a) R 12	erb)	is calle R 13	d link req c	gister. )R 14	d) R 1	5
3)	Philips ARM Mo a) 60 MHz ope b) 48 MHz ope c) 60 MHz ope d) 60 MHz ope	eration, 0.1 eration, 0.1 eration, 0.1	8 –mm CM6 8 –mm CM6 3 –mm CM6	OS emb	edded fast fla edded fast fla	ısh ısh	
4)	Using USB up t a) 2		device 64	-	e connected t ) 127	to a single ho d) 256	
5)	In ARM a) Reset c) System	,		ing high b	•	•	
6)	If External frequ VPBDIV values a) 0 × 23 and 0 c) 0 × 23 and 0	are 0 × 01	MHz, CCL	b	Hz and PCLK ) 0 × 23 and ) 0 × 22 and	0 × 00	en PLLCFG and
7)	On interrupt, pro a) Copies CPS c) Copies PC	SR to SPS	R mode	b	) Copies SP ) None of ab	SR to CPSR	mode
8)	$r2 = 0 \times 0000 \ 0$	002, r4 = 0	000 0000 × 0	01			
	LSL r2, r4 resul	ts					

a)  $r2 = 0 \times 0000\ 0004$ ,  $r4 = 0 \times 0000\ 0001$  b)  $r2 = 0 \times 0000\ 0004$ ,  $r4 = 0 \times 0000\ 0002$ 

c)  $r2 = 0 \times 0000\ 0001$ ,  $r2 = 0 \times 0000\ 0002$  d) None of above

P.T.O.



9)	Condition test for a) GT (greater than) means N and $Z = 0$ b) GT (greater than) means V and $Z = 0$ c) GT (greater than) means N= V and Z = d) GT (greater than) means $Z = 0$	0	
10)	In case of LPC2148, all PWM output will oc a) Same repetition rate c) Depends upon design	curs at b) Different repetition d) None of above	on rate
	SECTION	<b>1</b> – II	
11)	Medical devices often run aa) Real time b) Single user	operating system. c) Multi user	d) Network
12)	Event flags are used when  a) Task need to synchronise with the occu b) Task need to synchronise with the occu c) Interprocess communication required d) None of above		
13)	Scheduling is  a) Allowing jobs to use the processor b) Unrelated to performance consideration c) The same regardless of purpose of syst d) None of the above	tem	
14)	Memory management is a) not used in modern operating system b) replaced with virtual memory on current c) not used in multiprogramming system d) none of above	systems	
15)	Real time operating systems can be found i a) PDAS c) Cell phones	n b) Scientific instrur d) PDC	nents
16)	Round-robin scheduling a) Allows interactive task quicker access tb) Is quite complex to implement c) Gives each task the same chance at thd) None of the above	•	
,	Inter task communication can be done that a) Mailbox b) Queue		d) All of above
18)	Semaphore a) Synchronise critical resources to prever b) Are used to do I/O c) Are used for memory management d) None of above	nt dead lock	
19)	Process is a) Program in high level language kept on b) Content of main memory c) A program in execution d) A job in secondary memory	disk	
20)	<ul> <li>Which of the following option is not true?</li> <li>a) A signal is boolean notification</li> <li>b) A signal and semaphore are of one bit e</li> <li>c) A signal and mutex are of one bit each</li> <li>d) A signal, a semaphore and a message a</li> </ul>		

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#### B.E. (E & TC) (Part – II) (New) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

**Instructions**: 1) Assume suitable data if **required**.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain recent trends in embedded system.
- 2) Explain the controller area network.
- 3) Explain the features of LPC2148.
- 4) Explain communication protocol I2C bus.
- 5) Explain the concept of PLL in LPC2148.
- 3. Solve any two questions.

 $(10 \times 2 = 20)$ 

- 1) Explain exceptions, interrupt and vector table for ARM processor. What is TCM?
- 2) Describe operation with example of following ARM instructions.
  - a) LDRB
  - b) CMN
  - c) LSL
  - d) MLA
  - e) BX
- 3) Draw and explain the data flow model of ARM core.

Set R



#### SECTION - II

4. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain application of RTOS.
- 2) Explain Kernel Services in an Operating System (RTOS).
- 3) Explain Kernel structure of  $\mu$  cos II RTOS.
- 4) Draw and explain the block diagram of Mobile Phone.
- 5) Draw and explain block diagram of interfacing LED with ARM processor with program.
- 5. Solve **any two** questions.

 $(10 \times 2 = 20)$ 

- 1) Explain the following Kernel objects in RTOS.
  - a) Semaphore
  - b) Message Queue
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Draw interfacing diagram of 16 × 2 LCD with LPC2148. Write an embedded C program to display "Embedded Systems" message on 16 × 2 LCD.

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#### B.E. (E & TC) (Part – II) (New) Examination, 2016 EMBEDDED SYSTEMS

Day and Date: Wednesday, 23-11-2016 Total Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if required.
- 4) Figure to **right** indicate **full** marks.

#### MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

1. Choose the correct alternative:

(20×1=20)

SECTION - I

- 1) Condition test for
  - a) GT (greater than) means N and Z = 0
  - b) GT (greater than) means V and Z = 0
  - c) GT (greater than) means N = V and Z = 0
  - d) GT (greater than) means Z = 0
- 2) In case of LPC2148, all PWM output will occurs at
  - a) Same repetition rate

b) Different repetition rate

c) Depends upon design

- d) None of above
- 3) In ARM \_\_\_\_\_ exception is having highest priority.
  - a) Reset

b) Supervisor

c) System

- d) Interrupt Request
- 4) If External frequency = 12 MHz, CCLK= 48 MHz and PCLK = 24 MHz then PLLCFG and VPBDIV values are
  - a)  $0 \times 23$  and  $0 \times 01$

b)  $0 \times 23$  and  $0 \times 00$ 

c)  $0 \times 23$  and  $0 \times 02$ 

- d)  $0 \times 22$  and  $0 \times 00$
- 5) On interrupt, processor does the following
  - a) Copies CPSR to SPSR mode
- b) Copies SPSR to CPSR mode
- c) Copies PC to R12 mode
- d) None of above
- 6)  $r2 = 0 \times 0000 \ 0002$ ,  $r4 = 0 \times 0000 \ 0001$

LSL r2, r4 results

- a)  $r2 = 0 \times 0000\ 0004$ ,  $r4 = 0 \times 0000\ 0001$  b)  $r2 = 0 \times 0000\ 0004$ ,  $r4 = 0 \times 0000\ 0002$
- c)  $r2 = 0 \times 0000\ 0001$ ,  $r2 = 0 \times 0000\ 0002$  d) None of above
- 7) Philips ARM MCU LPC21xx has
  - a) 60 MHz operation, 0.18 -mm CMOS embedded fast flash
  - b) 48 MHz operation, 0.18 -mm CMOS embedded fast flash
  - c) 60 MHz operation, 0.13 -mm CMOS embedded fast flash
  - d) 60 MHz operation, 0.13 mm but no embedded fast flash



8)	Using USB up toa) 2	b) 64 devices may	be connected to a s	single host controller. d) 256
				full read-write access to
10)	a) Supervisor The ARM register	is called link	•	•
		SECTIO	N – II	
11)	Process is a) Program in high let b) Content of main me c) A program in exect d) A job in secondary	emory ution	disk	
12)	Which of the following a) A signal is boolean b) A signal and sema c) A signal and mutes d) A signal, a semaph	notification phore are of one bit one bit one bit one bit one bit each		
13)	Real time operating sy a) PDAS c) Cell phones	stems can be found	in b) Scientific instrui d) PDC	ments
14)	Round-robin schedulin a) Allows interactive b) Is quite complex to c) Gives each task th d) None of the above	task quicker access implement	to processor	
15)	Inter task communication (a) Mailbox			d) All of above
16)	Semaphore a) Synchronise critica b) Are used to do I/O c) Are used for memo d) None of above	·	ent dead lock	
17)	Scheduling is <ul><li>a) Allowing jobs to us</li><li>b) Unrelated to perfor</li><li>c) The same regardle</li><li>d) None of the above</li></ul>	mance consideration		
18)	Memory management a) not used in modern b) replaced with virtue c) not used in multipre d) none of above	n operating system al memory on curren	it systems	
19)	Medical devices often a) Real time	run a b) Single user	operating system. c) Multi user	d) Network
20)	Event flags are used v a) Task need to sync b) Task need to sync c) Interprocess comm d) None of above	hronise with the occi hronise with the occ		

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#### B.E. (E & TC) (Part – II) (New) Examination, 2016 EMBEDDED SYSTEMS

-3-

Day and Date: Wednesday, 23-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) Assume suitable data if required.

2) Figure to right indicate full marks.

#### SECTION - I

2. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain recent trends in embedded system.
- 2) Explain the controller area network.
- 3) Explain the features of LPC2148.
- 4) Explain communication protocol I2C bus.
- 5) Explain the concept of PLL in LPC2148.
- 3. Solve any two questions.

 $(10 \times 2 = 20)$ 

- 1) Explain exceptions, interrupt and vector table for ARM processor. What is TCM?
- 2) Describe operation with example of following ARM instructions.
  - a) LDRB
  - b) CMN
  - c) LSL
  - d) MLA
  - e) BX
- 3) Draw and explain the data flow model of ARM core.

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#### SECTION - II

4. Solve any four questions.

 $(5 \times 4 = 20)$ 

- 1) Explain application of RTOS.
- 2) Explain Kernel Services in an Operating System (RTOS).
- 3) Explain Kernel structure of  $\mu$  cos II RTOS.
- 4) Draw and explain the block diagram of Mobile Phone.
- 5) Draw and explain block diagram of interfacing LED with ARM processor with program.
- 5. Solve **any two** questions.

 $(10 \times 2 = 20)$ 

- 1) Explain the following Kernel objects in RTOS.
  - a) Semaphore
  - b) Message Queue
- 2) What are the states of Task? Draw and explain the characteristics of each task state. Explain with diagram task control block.
- 3) Draw interfacing diagram of  $16 \times 2$  LCD with LPC2148. Write an embedded C program to display "Embedded Systems" message on  $16 \times 2$  LCD.

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# B.E. (Part – I) (Electronics and Telecommunication)

	Examination, 2016  ADVANCED TELECOMMUNICATION NETWORK  Elective – I						
•	d Date : Thursd 3.00 p.m. to 6.0			Max	. Marks : 100		
1	Instructions :	in Answer Boo 2) <b>Answer MCC</b>	ok Page No <b>Q/Objective</b>	It should be solved in first 30 io . 3. Each question carries or type questions on Page No ., Q.P. Set (P/Q/R/S) on Top	ne mark. Io. 3 only.		
Duration	n : 30 Minutes	MCQ/Obje	ective Type	Questions	Marks : 20		
Duration	1. 30 Millutes				iviains . 20		
	ect an appropri	•			(20×1=20)		
1)	wman corres a) IEEE 802. c) IEEE 802.	11		IEEE 802.15 None of the above			
2)	a) 10 to 66 Gi c) 10 to 66 Ki		b)	_ frequency spectrum. 10 to 66 MHz None of the above			
3)	GFSK and FH a) 802.15.1 c) 802.15.4	SS modulation so	b)	used in IEEE 802.15.3 None of the above			
4)	Bluetooth ope a) 2.4 GHz c) 2.4 KHz	rates over	b)	equency band. 2.4 MHz None of the above			
5)		us Optical Netwo		Synchronous Original Netwo	ork		
6)	a) Long Term c) Long Term	Evolution	•	Large Term Evolution Large term Expiry			
7)	-) CONET	_ is a standard de	veloped by	ANSI for fiber optic networks	<b>3.</b>		

a) SONET b) SDH

c) Either (a) or (b) d) Neither (a) nor (b)

8) SDH has defined hierarchy of signals called

c) Either (a) or (b) d) Neither (a) nor (b) a) STSs b) STMs

9)	SONET defines layers.		F	۔1۱	Fi
40\	a) Two b) Three	C)	Four	a)	Five
10)	SONET network topologies can be a) Linear b) Ring	c)	Mesh	d)	All of the above
11)	is to determine spectrum	,		,	
,	users.	ıı a	ranability and the	0100	
	<ul><li>a) Spectrum sensing</li><li>c) Spectrum mobility</li></ul>		Spectrum sharin None of the above		
12)	is to distribute the spe	,			g the secondary
,	users bearing in mind usage cost.		_		g ino boothaary
	a) Spectrum sensing	b)	Spectrum sharin None of the above	g	
13)	· · · · · · · · · · · · · · · · · · ·	s co	ommunication req	uire	ements during
	the transition to better spectrum. a) Spectrum sensing	h)	Spectrum sharin	a	
	c) Spectrum mobility	,	None of the above	_	
14)	Cognitive cycle consists of	,			
,	a) Spectrum sharing	,	Spectrum sensing	ng	
	c) Spectrum mobility	,	All of the above		
15)	In communication, idep			en u	user and base station
	<ul><li>are generated via introduction of relay c</li><li>a) Cooperative</li><li>b) Correlative</li></ul>			٩/	None of the above
16\	In relaying, if signal to no	-	_	-	
10)	a ceratin threshold, relay performs deco				
	a) Fixed b) Adaptive				
17)	MIMO stands for				
	a) Multiple Input Multiple Output				
	c) Multiple Instructions Multiple Output	d)	Memory In Memo	ory	Out
18)	CR stands for	h)	Cognizent Padio		
	<ul><li>a) Cognitive Radio</li><li>c) Correlative Radio</li></ul>	,	Cognizent Radio		
19)	can be used for tele-he	,			
- /	a) Cognitive Radio		Cooperative Cor	nm	unications
	c) Both (a) and (b)	d)	None of the above	vе	
20)	ITU stands for				
	<ul><li>a) International Telecommunication Un</li><li>b) International Territory Union</li></ul>	ion			
	c) Indian Telecommunication Union				
	d) Indian Territory Union				



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# B.E. (Part – I) (Electronics and Telecommunication) Examination, 2016 ADVANCED TELECOMMUNICATION NETWORK

Elective – I Day and Date: Thursday, 8-12-2016 Marks: 80 Time: 3.00 p.m. to 6.00 p.m. 20 2. Solve any four: a) Compare WLAN standards namely IEEE 802.11, IEEE 802.11b, IEEE 802.11a and IEEE 802.11g. b) What features are provided in IEEE 802.11 for robustness in data transmission? c) Explain the concept of fixed mobile convergence in NGN. d) Write a note on Wimax advanced. e) Explain Metro optical networking. 3. Solve any two: 20 a) What do you mean by WMAN? Explain its typical features and enumerate important physical layer parameters of IEEE 802.16. b) Draw and explain the architecture of IP and MPLS based optical transport network. c) Explain transition of IP network to NGN. 4. Solve any four: 20 a) Explain the conceptual structure of cooperative communication. b) Mention the benefits and drawbacks of cooperative communication. c) Draw the architecture of cognitive radio network. d) What the special requirements of telehealthcare? e) Discuss the applications of cooperative communication. 5. Solve any two: 20 a) Discuss cooperative communication enabled MIMO and smart antenna concept.

b) Explain the strcturing knowledge for cognition tasks.

c) Explain how cooperative communication is used for telehealthcare.


c) 10 to 66 KHz

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# B.E. (Part – I) (Electronics and Telecommunication) Examination, 2016

	Examination   ADVANCED TELECOMMU Elective	JŃ	ICATION NETWORK
•	d Date : Thursday, 8-12-2016 3.00 p.m. to 6.00 p.m.		Max. Marks : 100
	in Answer Book Page 2) <b>Answer MCQ/Objec</b>	No tive	It should be solved in <b>first 30 minutes</b> b. <b>3. Each</b> question carries <b>one</b> mark.  c type questions on Page No. 3 only.  d, Q.P. Set (P/Q/R/S) on Top of Page.
Duratio	MCQ/Objective Ty	ype	
Duratio	n : 30 Minutes		Marks : 20
1. Sel	lect an appropriate option :		(20×1=20)
1)	In relaying, if signal to exceeds a ceratin threshold, relay performessage.	ms	decode and forward operation on the
0)	a) Fixed b) Adaptive	C)	Both (a) and (b) d) None of the above
2)	MIMO stands for a) Multiple Input Multiple Output c) Multiple Instructions Multiple Output	,	
3)	CR stands for	h)	Cognizent Radio
	<ul><li>a) Cognitive Radio</li><li>c) Correlative Radio</li></ul>	,	None of the above
4)	can be used for tele-he	altl	ncare.
	<ul><li>a) Cognitive Radio</li><li>c) Both (a) and (b)</li></ul>	,	Cooperative Communications None of the above
5)	ITU stands for a) International Telecommunication Un b) International Territory Union c) Indian Telecommunication Union d) Indian Territory Union	iion	
6)	WMAN corresponds to a) IEEE 802.11 c) IEEE 802.16	,	IEEE 802.15 None of the above
7)	IEEE 802.16 operates overa) 10 to 66 GHz	b)	_ frequency spectrum. 10 to 66 MHz

d) None of the above

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8)	GFSK and FHSS modulation schemes a 802.15.1 c) 802.15.4	b)	used in IEEE 802.15.3 None of the abov	'e		
9)	Bluetooth operates overa) 2.4 GHz c) 2.4 KHz	,				
10)	SONET stands for a) Synchronous Optical Network c) Asynchronous Optical Network		Synchronous Ori None of the abov		al Network	
11)	LTE stands for a) Long Term Evolution c) Long Term Expiry	b) d)	Large Term Evolution	utic y	on	
12)	a) SONET c) Either (a) or (b)		ANSI for fiber opt SDH Neither (a) nor (b		networks.	
13)	SDH has defined hierarchy of signals ca a) STSs b) STMs			d)	Neither (a) nor (b)	
14)	SONET defines layers a) Two b) Three		Four	d)	Five	
·	SONET network topologies can be a) Linear b) Ring					
16)	is to determine spectrur users.	n av	ailability and the p	res	sence of licensed	
	a) Spectrum sensing     c) Spectrum mobility	,	Spectrum sharing None of the above	_		
17)	is to distribute the spe users bearing in mind usage cost.	ctru	ım holes fairly am	on	g the secondary	
	a) Spectrum sensing	,	Spectrum sharing None of the above	_		
18)	is to maintain seamles the transition to better spectrum.  a) Spectrum sensing c) Spectrum mobility	b)	ommunication requestions of the Spectrum sharing None of the above	9	ements during	
19)	Cognitive cycle consists of a) Spectrum sharing c) Spectrum mobility	,	Spectrum sensin All of the above	g		
20)	In communication, idep are generated via introduction of relay c a) Cooperative b) Correlative	har	nnel.		ser and base station  None of the above	



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# B.E. (Part – I) (Electronics and Telecommunication) Examination, 2016 ADVANCED TELECOMMUNICATION NETWORK Elective – I

Day and Date: Thursday, 8-12-2016 Marks: 80 Time: 3.00 p.m. to 6.00 p.m. 20 2. Solve any four: a) Compare WLAN standards namely IEEE 802.11, IEEE 802.11b, IEEE 802.11a and IEEE 802.11g. b) What features are provided in IEEE 802.11 for robustness in data transmission? c) Explain the concept of fixed mobile convergence in NGN. d) Write a note on Wimax advanced. e) Explain Metro optical networking. 20 3. Solve any two: a) What do you mean by WMAN? Explain its typical features and enumerate important physical layer parameters of IEEE 802.16. b) Draw and explain the architecture of IP and MPLS based optical transport network.

# 4. Solve any four:

20

- a) Explain the conceptual structure of cooperative communication.
- b) Mention the benefits and drawbacks of cooperative communication.
- c) Draw the architecture of cognitive radio network.

c) Explain transition of IP network to NGN.

- d) What the special requirements of telehealthcare?
- e) Discuss the applications of cooperative communication.

#### 5. Solve any two:

20

- a) Discuss cooperative communication enabled MIMO and smart antenna concept.
- b) Explain the strcturing knowledge for cognition tasks.
- c) Explain how cooperative communication is used for telehealthcare.

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# B.E. (Part – I) (Electronics and Telecommunication) Examination, 2016 ADVANCED TELECOMMUNICATION NETWORK Elective – I

Day and Date: Thursday, 8-12-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

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

		MCQ/Objective Ty	ype	Questions
Dura	tior	n : 30 Minutes	•	Marks : 20
1. \$	Sel	ect an appropriate option :		(20×1=20)
	1)	is to determine spectrum	n av	vailability and the presence of licensed
		users.	1. \	
		a) Spectrum sensing	b)	Spectrum sharing
		c) Spectrum mobility	•	None of the above
	2)	is to distribute the spe	ctru	um holes fairly among the secondary
		users bearing in mind usage cost.		
		a) Spectrum sensing	b)	Spectrum sharing
		<ul><li>a) Spectrum sensing</li><li>c) Spectrum mobility</li></ul>	d)	None of the above
	3)	is to maintain seamles	s co	ommunication requirements during
		the transition to better spectrum.		
				Spectrum sharing
		c) Spectrum mobility	d)	None of the above
	4)	Cognitive cycle consists of		
		a) Spectrum sharing	b)	Spectrum sensing
		c) Spectrum mobility	d)	All of the above
	5)	In communication, idep	enc	dent paths between user and base station
	,	are generated via introduction of relay c		
		a) Cooperative b) Correlative	c)	Congestive d) None of the above
	6)	In relaying, if signal to no	ise	ratio of signal received at the relay exceeds
	,	a ceratin threshold, relay performs deco		
		• •		Both (a) and (b) d) None of the above
	7)	MIMO stands for		
	.,	a) Multiple Input Multiple Output	b)	Multiple Output Multiple Input
		c) Multiple Instructions Multiple Output		



8)	CR stands for a) Cognitive Radio	b) Cognizent Radio
	c) Correlative Radio	d) None of the above
9)	can be used for tele-he	ealthcare.
	<ul><li>a) Cognitive Radio</li><li>c) Both (a) and (b)</li></ul>	<ul><li>b) Cooperative Communications</li><li>d) None of the above</li></ul>
10)	ITU stands for a) International Telecommunication Un b) International Territory Union c) Indian Telecommunication Union d) Indian Territory Union	nion
11)	WMAN corresponds to a) IEEE 802.11 c) IEEE 802.16	b) IEEE 802.15 d) None of the above
12)	a) 10 to 66 GHz c) 10 to 66 KHz	frequency spectrum. b) 10 to 66 MHz d) None of the above
13)	GFSK and FHSS modulation schemes a a) 802.15.1 c) 802.15.4	are used in IEEE b) 802.15.3 d) None of the above
14)	Bluetooth operates over a) 2.4 GHz c) 2.4 KHz	frequency band. b) 2.4 MHz d) None of the above
15)	SONET stands for a) Synchronous Optical Network c) Asynchronous Optical Network	<ul><li>b) Synchronous Original Network</li><li>d) None of the above</li></ul>
16)	LTE stands for a) Long Term Evolution c) Long Term Expiry	<ul><li>b) Large Term Evolution</li><li>d) Large term Expiry</li></ul>
17)	a) SONET c) Either (a) or (b)	d by ANSI for fiber optic networks. b) SDH d) Neither (a) nor (b)
18)	SDH has defined hierarchy of signals ca a) STSs b) STMs	called c) Either (a) or (b) d) Neither (a) nor (b
19)	SONET defines layers a) Two b) Three	
20)	SONET network topologies can be	c) Mesh d) All of the above



Seat	
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# B.E. (Part – I) (Electronics and Telecommunication) Examination, 2016 ADVANCED TELECOMMUNICATION NETWORK Elective – I

Day and Date: Thursday, 8-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

# 2. Solve any four:

20

- a) Compare WLAN standards namely IEEE 802.11, IEEE 802.11b, IEEE 802.11a and IEEE 802.11g.
- b) What features are provided in IEEE 802.11 for robustness in data transmission?
- c) Explain the concept of fixed mobile convergence in NGN.
- d) Write a note on Wimax advanced.
- e) Explain Metro optical networking.

# 3. Solve any two:

20

- a) What do you mean by WMAN? Explain its typical features and enumerate important physical layer parameters of IEEE 802.16.
- b) Draw and explain the architecture of IP and MPLS based optical transport network.
- c) Explain transition of IP network to NGN.

# 4. Solve any four:

20

- a) Explain the conceptual structure of cooperative communication.
- b) Mention the benefits and drawbacks of cooperative communication.
- c) Draw the architecture of cognitive radio network.
- d) What the special requirements of telehealthcare?
- e) Discuss the applications of cooperative communication.

# 5. Solve any two:

20

- a) Discuss cooperative communication enabled MIMO and smart antenna concept.
- b) Explain the strcturing knowledge for cognition tasks.
- c) Explain how cooperative communication is used for telehealthcare.

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Seat		
No.	Set	6
IVO.		5

# B.E. (Part – I) (Electronics and Telecommunication)

	ADVA		xaminatioı ECOMMU Elective	Ń	ICATION NET	T <b>W</b>	ORK
•	d Date : Thursda 3.00 p.m. to 6.0	• .					Max. Marks: 100
I	Instructions :	in Answer I	Book Page l M <b>CQ/Objecti</b>	No ve	o. 3. Each questions type questions	on c on	first 30 minutes earries one mark. Page No. 3 only. on Top of Page.
Duration	n : 30 Minutes	MCQ/C	Objective Typ	pe	Questions		Marks : 20
	ect an appropri	-					(20×1=20)
1)	<ul><li>LTE stands for</li><li>a) Long Term</li><li>c) Long Term</li></ul>	Evolution			Large Term Evo Large term Expir		on
2)	a) SONET c) Either (a) o		ł	b)	ANSI for fiber op SDH Neither (a) nor (l		networks.
3)	SDH has defin a) STSs	-	_			d)	Neither (a) nor (b)
4)	SONET define a) Two	s b) Thr	layers. ee	c)	Four	d)	Five
5)	SONET netwo	rk topologies b) Rin	can be	c)	Mesh	d)	All of the above
					ailability and the		
	users. a) Spectrum s c) Spectrum r	=		-	Spectrum sharin	_	
7)				tru	ım holes fairly ar	non	g the secondary
	<ul><li>a) Spectrum s</li><li>c) Spectrum r</li></ul>	sensing	ŀ	•	Spectrum sharin	_	

8) \_\_\_\_\_ is to maintain seamless communication requirements during

b) Spectrum sharingd) None of the above

c) Spectrum mobility

a) Spectrum sensing

the transition to better spectrum.

9)	Cognitive cycle consists of				
·	<ul><li>a) Spectrum sharing</li><li>c) Spectrum mobility</li></ul>	,	Spectrum sensing All of the above		
10)			lent paths between user and base station		
	are generated via introduction of relay c				
	, ,	,	Congestive d) None of the above		
11)			ratio of signal received at the relay exceeds		
	<ul><li>a ceratin threshold, relay performs decor</li><li>a) Fixed</li><li>b) Adaptive</li></ul>		Both (a) and (b) d) None of the above		
12)	MIMO stands for	Ο,	Don' (a) and (b) a) Items of the above		
12)	a) Multiple Input Multiple Output	b)	Multiple Output Multiple Input		
	c) Multiple Instructions Multiple Output				
13)	CR stands for				
	a) Cognitive Radio	,	Cognizent Radio		
	c) Correlative Radio	,	None of the above		
14) can be used for tele-healthcare.					
	<ul><li>a) Cognitive Radio</li><li>c) Both (a) and (b)</li></ul>	,	Cooperative Communications None of the above		
15\	ITU stands for	u)	None of the above		
13)	a) International Telecommunication Un	ion			
	b) International Territory Union				
	c) Indian Telecommunication Union				
	d) Indian Territory Union				
16)	WMAN corresponds to		JEEE 202.45		
	a) IEEE 802.11 c) IEEE 802.16	,	IEEE 802.15 None of the above		
17\		u)			
17)	a) 10 to 66 GHz	h)	_ frequency spectrum. 10 to 66 MHz		
	c) 10 to 66 KHz	,	None of the above		
18)	GFSK and FHSS modulation schemes a	are	used in IEEE		
,	a) 802.15.1	b)	802.15.3		
	c) 802.15.4	d)	None of the above		
19)	Bluetooth operates over		equency band.		
	a) 2.4 GHz	,	2.4 MHz		
00)	c) 2.4 KHz	u)	None of the above		
20)	SONET stands for a) Synchronous Optical Network	h)	Synchronous Original Network		
	c) Asynchronous Optical Network	,	None of the above		



Seat	
No.	

# B.E. (Part – I) (Electronics and Telecommunication) Examination, 2016 ADVANCED TELECOMMUNICATION NETWORK Elective – I

Day and Date: Thursday, 8-12-2016

Time: 3.00 p.m. to 6.00 p.m.

2. Solve any four:

a) Compare WLAN standards namely IEEE 802.11, IEEE 802.11b, IEEE 802.11a and IEEE 802.11g.

b) What features are provided in IEEE 802.11 for robustness in data transmission?

c) Explain the concept of fixed mobile convergence in NGN.

d) Write a note on Wimax advanced.
e) Explain Metro optical networking.

- a) What do you mean by WMAN? Explain its typical features and enumerate important physical layer parameters of IEEE 802.16.
- b) Draw and explain the architecture of IP and MPLS based optical transport network.
- c) Explain transition of IP network to NGN.

# 4. Solve any four:

20

- a) Explain the conceptual structure of cooperative communication.
- b) Mention the benefits and drawbacks of cooperative communication.
- c) Draw the architecture of cognitive radio network.
- d) What the special requirements of telehealthcare?
- e) Discuss the applications of cooperative communication.

# 5. Solve any two:

20

- a) Discuss cooperative communication enabled MIMO and smart antenna concept.
- b) Explain the strcturing knowledge for cognition tasks.
- c) Explain how cooperative communication is used for telehealthcare.

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Seat No.	Set	Р

		E & TC) (Part – AGE PROCESS	•		
-	d Date : Thursday, 3.00 p.m. to 6.00 p			Max. N	1arks : 100
,	2) 3) 4)	All questions are configures to the right Figures to the right Q. No. 1 is compuls in Answer Book Pag Answer MCQ/Obje Don't forget to me	t indicate <b>full</b> ma cory. It should be ge No. 3. Each qu ctive type quest	solved in <b>first 30</b> uestion carries <b>o</b> i <b>ions on Page N</b> o	ne mark. o. 3 only.
		MCQ/Objective	Type Questions		
Duratio	n : 30 Minutes				Marks : 20
	oose the correct a				(1×20=20)
1)	The graph showing is nothing but a) Plot	ng no. of occurrenc b) Histogram	•		_
	below threshold a a) Contrast streto c) Restoration	contrast can be paind brightening the ching	levels above thre b) Contrast red d) None	eshold is called duction	levels
-,	a) The input imag	_	b) Gradient of	input image	eching
4)	The transform wha) Random	ich is recommende b) DCT	ed in Baseline JP c) Walsh		
5)	In general compre channel block. a) Before	ession model the er	ncoder block is c) Upside	the d) Downsid	e
6)	Entropy Coding is a) Lossless coding b) Lossy coding c) Lossless codin	,	e psycho visual esycho visual red e statistical redu	redundancy lundancy Indancy	·
7)	Currently image of a) Enabling	ompression is reco b) Disabling	gnized as an c) Both	techno d) None	ology.



8)	A biometrics may be			
	a) Fingerprint images	•	Satellite images	S
	c) Computer vision	d)	None	
9)	Information lost when express		•	
	a) Markow	,	Finite memory	
	c) Fidelity criteria	•	Noiseless theor	
10)	The chain code of a boundary			
	a) Start b) End	,	Middle	•
11)	In lossless image compression	on the data	reduction is acc	eptable in many
	applications, due to	<b>L</b> \	Not deciroble	
	<ul><li>a) Loss is desirable</li><li>c) Both</li></ul>	,	Not desirable None	
10\	,	,	NONE	
12)	Digital images have edges that a) Blur b) Noisy		Clear	d) Both a) and b)
10\	, , ,	,		d) Doill a) and b)
13)	What algorithm is used in fing a) Intensity based algorithm		Pattern based a	algorithm
	c) Feature based algorithm	•	Recognition alg	_
14)	In RGB colour image each pix	•		, -
' '/	a) 8-bit b) 24-bit		16-bit	d) 4-bit
15)	The smallest descendible det	,		,
.0,	a) Spatial resolution		Gray level reso	lution
	c) Multi-resolution	,	None	
16)	Image function is characterize	ed by		
,	a) Reflectance component	-	Illumination con	nponent
	c) Both a) and b)	d)	None	
17)	Digitizing the amplitude value	of continuo	ous image is call	ed
	a) Quantization	,	Sensing the ima	age
	c) Acquisition		Sampling	
18)	Statement 1: A histogram giv	es the frequ	ency of occurre	nce of the gray level
	Statement 2 : A histogram is i		rotation	
	a) Statement 1 and 2 are wro	•		
	b) Statement 1 is correct and			
	<ul><li>c) Statement 1 and 2 are cor</li><li>d) Statement 2 is correct and</li></ul>			
10\	,	J		
19)	Dilation followed by erosion o a) Closing b) Openir	•	Union	d) Intersection
20)	Which of the following filter w	,		,
20)	enhancing edge in an image?	_	i nave the best p	Jonomianos III
			Laplace filter	d) Mode filter
	•	•	-	



Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 IMAGE PROCESSING (Elective - I)

Marks: 80 Day and Date: Thursday, 8-12-2016 Time: 3.00 p.m. to 6.00 p.m. Instructions: 1) All questions are compulsory. 2) Figures to the **right** indicate **full** marks. SECTION - I 2. Solve any four:  $(4 \times 5 = 20)$ i) Explain image restoration Model. ii) Explain RGB color Model. iii) Explain smoothing filters. iv) Explain image sampling and quantization. v) Define histogram and explain histogram equalization. 3. i) Explain different type of image acquisition sensors and their parameters. 10 ii) Explain image sharpening in frequency domain. 10 OR ii) Explain dilation and erosion with example. 10 SECTION - II 4. Solve any four from the following:  $(5 \times 4 = 20)$ i) Explain various image redundancy techniques.

- ii) What is error free compression?
- iii) Explain sub band coding technique.
- iv) Explain edge linking technique.
- v) What is fidelity criteria and explain.
- 5. i) Explain the JEPEG coding in detail.

10

ii) Explain the chain coding with an example.

10

ii) Explain fingerprint recognition as an application in image processing.

10

Seat No.		Set	Q
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		& TC) (Part – I GE PROCESSI				6	
	d Date : Thursday, 8 3.00 p.m. to 6.00 p.r					Max. Max	arks : 100
	3) Q in 4) <b>A</b>	II questions are co igures to the <b>right</b> . No. 1 is <b>compuls</b> Answer Book Pag nswer MCQ/Objec on't forget to men	ina ory e N ctiv	licate <b>full</b> marks . It should be sol <sup>,</sup> lo. <b>3</b> . <b>Each</b> ques <b>e type question</b>	ved i ition i <b>s or</b>	carries <b>on</b> <b>1 Page No</b> .	n <b>e</b> mark. . <b>3 only.</b>
D	00 M*- 1	MCQ/Objective T	уре	Questions			<b>4</b> - 4 - 00
	on : 30 Minutes						/larks : 20
1. Ch	oose the correct and	swer:				(	(1×20=20)
1)	Image function is c a) Reflectance con c) Both a) and b)	-	,	Illumination cor None	npo	nent	
2)	Digitizing the ampli a) Quantization c) Acquisition	tude value of cont	b)	ous image is cal Sensing the im Sampling			
3)	Statement 1: A his Statement 2: A his a) Statement 1 and b) Statement 1 is d c) Statement 1 and d) Statement 2 is d	togram is invariand 2 are wrong correct and 2 is wr	t to	rotation	nce	of the gray	'level
4)	Dilation followed by a) Closing	<del>_</del>			d)	Intersection	on
5)	Which of the follow enhancing edge in a Mean filter	_		•	-		
6)	The graph showing is nothing but a) Plot	no. of occurrence b) Histogram			•	vel of an ir Barchart	nage
7)	Images of higher co	ontrast can be pro	duc	ed by darkening	the	•	ls

b) Contrast reduction

c) Restoration

a) Contrast stretching

d) None



8)	The watershed trana) The input image c) Input image after	directly	b)	Gradient of inpu	ut in	nage
9)	The transform whice a) Random					
10)	In general compres channel block.					
	a) Before	b) After	c)	Upside	d)	Downside
11)	<ul><li>Entropy Coding is k</li><li>a) Lossless coding</li><li>b) Lossy coding wl</li><li>c) Lossless coding</li><li>d) Lossy coding wl</li></ul>	y which exploits the hich exploits the ps y which exploits the	syc e st	ho visual redunc atistical redunda	dano ancy	СУ
12)	Currently image co	mpression is recog	gniz	ed as an		technology.
•		b) Disabling				None
13)	A biometrics may ba) Fingerprint imag c) Computer vision	jes	•	Satellite images	3	
14)	<ul><li>Information lost wh</li><li>a) Markow</li><li>c) Fidelity criteria</li></ul>	en expressed mat	b)	natically is called Finite memory : Noiseless theol	sou	
15)	The chain code of a	ι boundary depend	s o	n the	p	oint.
	a) Start	b) End	c)	Middle	d)	Last
16)	In lossless image capplications, due to a) Loss is desirable. Both	)	b)	reduction is acco Not desirable None	epta	able in many
17)	Digital images have a) Blur	e edges that are b) Noisy	c)	Clear	d)	Both a) and b)
18)	What algorithm is u a) Intensity based a c) Feature based a	algorithm	tec b)		algo	rithm
19)	In RGB colour imag a) 8-bit	ge each pixel resol b) 24-bit		on is 16-bit	d)	4-bit
20)	The smallest desce a) Spatial resolution c) Multi-resolution		b)	age is called Gray level reso None	lutio	on



Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 IMAGE PROCESSING (Elective - I)

Marks: 80 Day and Date: Thursday, 8-12-2016 Time: 3.00 p.m. to 6.00 p.m. Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks. SECTION - I 2. Solve any four:  $(4 \times 5 = 20)$ i) Explain image restoration Model. ii) Explain RGB color Model. iii) Explain smoothing filters. iv) Explain image sampling and quantization. v) Define histogram and explain histogram equalization. 3. i) Explain different type of image acquisition sensors and their parameters. 10 ii) Explain image sharpening in frequency domain. 10 OR ii) Explain dilation and erosion with example. 10 SECTION - II  $(5 \times 4 = 20)$ 4. Solve **any four** from the following: i) Explain various image redundancy techniques. ii) What is error free compression? iii) Explain sub band coding technique. iv) Explain edge linking technique. v) What is fidelity criteria and explain. 5. i) Explain the JEPEG coding in detail. 10 ii) Explain the chain coding with an example. 10

ii) Explain fingerprint recognition as an application in image processing.

Set Q

10


c) Acquisition

# **SLR-EP - 469**

	 _	
Seat	Set	В
No.	Sei	n

	B.E. (E & TC) (Part – I IMAGE PROCESSI	-			6
•	d Date : Thursday, 8-12-2016 3.00 p.m. to 6.00 p.m.				Max. Marks: 100
•	Instructions: 1) All questions are co 2) Figures to the right 3) Q. No. 1 is compulse in Answer Book Pag 4) Answer MCQ/Object Don't forget to men	indi <b>ory</b> . e N <b>ctive</b>	icate <b>full</b> marks. It should be solv o. <b>3. Each</b> quest <b>e type question</b> :	red . tion <b>s or</b>	carries <b>one</b> mark. <b>n Page No. 3 only.</b>
Duratio	MCQ/Objective T n : 30 Minutes	ype	Questions		Marks : 20
_	oose the correct answer:				(1×20=20)
1)	In lossless image compression the data applications, due to a) Loss is desirable c) Both	b)	Not desirable None	epta	able in many
2)	Digital images have edges that are a) Blur b) Noisy	c)	Clear	d)	Both a) and b)
3)	What algorithm is used in finger print <ul><li>a) Intensity based algorithm</li><li>c) Feature based algorithm</li></ul>	b)	nnology ? Pattern based a Recognition alg	_	
4)	In RGB colour image each pixel resolution a) 8-bit b) 24-bit		n is 16-bit	d)	4-bit
5)	The smallest descendible detail in an a) Spatial resolution c) Multi-resolution	b)	age is called Gray level reso None	lutio	on
6)	Image function is characterized by a) Reflectance component c) Both a) and b)	,	Illumination con None	про	nent
7)	Digitizing the amplitude value of conti a) Quantization		ous image is call Sensing the ima		

d) Sampling

-2-



8)	Statement 1: A hist	togram gives the fro	equency of occurre	nce of the gray level
	Statement 2 : A his a) Statement 1 and b) Statement 1 is o c) Statement 1 and d) Statement 2 is o	d 2 are wrong correct and 2 is wro d 2 are correct	ong	
9)	Dilation followed by a) Closing	erosion operation b) Opening		d) Intersection
10)	Which of the follow enhancing edge in a a) Mean filter	an image ?		
11)	The graph showing is nothing but	no. of occurrence	of pixels of K <sup>th</sup> gra	ay level of an image
12)	<ul><li>a) Plot</li><li>Images of higher of below threshold and a) Contrast stretch</li><li>c) Restoration</li></ul>	contrast can be pr d brightening the le	oduced by darken	ning the gray levels old is called
13)	The watershed trana) The input image c) Input image after	directly	b) Gradient of inp	
14)	The transform whice a) Random		d in Baseline JPEG c) Walsh	
15)	In general compres channel block.			
40\	OI DOTORO			
16)	a) before  Entropy Coding is k a) Lossless coding b) Lossy coding wl c) Lossless coding d) Lossy coding wl	pasically a which exploits the nich exploits the ps which exploits the	sycho visual redund e statistical redunda	undancy dancy ancy
ŕ	Entropy Coding is to a) Lossless coding b) Lossy coding who c) Lossless coding	pasically a g which exploits the nich exploits the ps g which exploits the nich exploits the st	e psycho visual red sycho visual redund e statistical redunda atistical redundand	undancy dancy ancy cy
17)	Entropy Coding is to a) Lossless coding b) Lossy coding who c) Lossless coding d) Lossy coding who currently image con	pasically a g which exploits the prich exploits the point of the prich exploits the prich exploits the st prich exploits the st prich exploits recog b) Disabling price prices	e psycho visual red sycho visual redund e statistical redunda atistical redundand gnized as an	undancy dancy ancy eytechnology. d) None
17) 18)	Entropy Coding is to a) Lossless coding b) Lossy coding who c) Lossless coding d) Lossy coding who Currently image code a) Enabling A biometrics may be a) Fingerprint image	pasically a g which exploits the paich exploits the g which exploits the paich exploits the st paich exploits the st paich exploits the st paich exploits recog b) Disabling pe pes pes	e psycho visual red sycho visual redund e statistical redundand atistical redundand gnized as an c) Both b) Satellite image d) None	undancy dancy ancy ancy  technology. d) None  s d source



Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 IMAGE PROCESSING (Elective – I)

Day and Date: Thursday, 8-12-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks.

### SECTION - I

2. Solve any four: (4×5=20)

- i) Explain image restoration Model.
- ii) Explain RGB color Model.
- iii) Explain smoothing filters.
- iv) Explain image sampling and quantization.
- v) Define histogram and explain histrogram equalization.
- 3. i) Explain different type of image acquisition sensors and their parameters. 10
  - ii) Explain image sharpening in frequency domain.

OR

ii) Explain dilation and erosion with example.

10

10

## SECTION - II

4. Solve any four from the following:

 $(5 \times 4 = 20)$ 

- i) Explain various image redundancy techniques.
- ii) What is error free compression?
- iii) Explain sub band coding technique.
- iv) Explain edge linking technique.
- v) What is fidelity criteria and explain.

5. i) Explain the JEPEG coding in detail.

10

ii) Explain the chain coding with an example.

10

OR

ii) Explain fingerprint recognition as an application in image processing.

Set R

10


Seat No.	Set	S
No.		

	•	AGE PROCESS	•	•		
•	d Date : Thursday, 8 3.00 p.m. to 6.00 p.				Max	k. Marks : 100
	3) C ir 4) <b>A</b>	II questions are digures to the <b>righ</b> D. No. 1 is <b>compul</b> Answer Book Pa Inswer MCQ/Obj Oon't forget to me	nt ind sory age N ectiv	licate <b>full</b> marks . It should be sol <sup>l</sup> lo. <b>3</b> . <b>Each</b> ques <b>e type questio</b> n	ved in <b>first</b> stion carrie <b>is on Page</b>	s <b>one</b> mark. • <b>No. 3 only.</b>
		MCQ/Objective	Туре	Questions		
Duratio	on : 30 Minutes					Marks : 20
1. Ch	oose the correct an	swer:				(1×20=20)
	<ul> <li>Entropy Coding is</li> <li>a) Lossless coding</li> <li>b) Lossy coding w</li> <li>c) Lossless coding</li> <li>d) Lossy coding w</li> </ul>	g which exploits the hich exploits the gwhich exploits the hich exploits the	psyc he st statis	ho visual redund atistical redund stical redundand	dancy ancy cy	anology
۷)	Currently image co a) Enabling	b) Disabling	_	Both	d) None	hnology.
3)	<ul><li>A biometrics may k</li><li>a) Fingerprint imag</li><li>c) Computer vision</li></ul>	ges	,	Satellite image None	S	
4)	Information lost wha) Markow c) Fidelity criteria	nen expressed ma	b)	natically is calle Finite memory Noiseless theo	source	
5)	The chain code of a a) Start	a boundary deper b) End		n the Middle	point. d) Last	
6)	In lossless image of applications, due to a) Loss is desirable c) Both	)	b)	reduction is acc Not desirable None	eptable in	many
7)	Digital images hav a) Blur	e edges that are b) Noisy	c)	Clear	d) Both	a) and b)



8)	What algorithm is u a) Intensity based a c) Feature based a	algorithm	b)	nnology ? Pattern based a Recognition alg	_	
9)	In RGB colour imag a) 8-bit	ge each pixel resol b) 24-bit		on is 16-bit	d)	4-bit
10)	The smallest desce a) Spatial resolution c) Multi-resolution		b)	age is called Gray level reso None	lutio	on
11)	Image function is cl a) Reflectance con c) Both a) and b)	,	,	Illumination con None	npo	nent
12)	Digitizing the ampli a) Quantization c) Acquisition	tude value of conti	b)	ous image is call Sensing the ima Sampling		
13)	Statement 1: A hist Statement 2: A his a) Statement 1 and b) Statement 1 is d c) Statement 1 and d) Statement 2 is d	togram is invariant I 2 are wrong correct and 2 is wro I 2 are correct	t to ong	rotation	nce	of the gray level
14)	Dilation followed by a) Closing	erosion operation	lea		d)	Intersection
15)	Which of the follow enhancing edge in a a) Mean filter	ing filter will in gen an image ?	era	ا have the best ا	erf	ormance in
16)	The graph showing is nothing but a) Plot	no. of occurrence b) Histogram		pixels of K <sup>th</sup> gra Probability	-	vel of an image Barchart
17)	Images of higher of below threshold an a) Contrast stretch c) Restoration	contrast can be pr d brightening the le	odi eve b)	uced by darken	ing old i	the gray levels
18)	The watershed trana) The input image c) Input image after	directly	b)	Gradient of inpu	ut in	nage
19)	The transform whice a) Random	h is recommended b) DCT		Baseline JPEG Walsh		
20)	In general compres channel block.	sion model the end	cod	er block is		the
	a) Before	b) After	c)	Upside	d)	Downside



Seat	
No.	

# B.E. (E & TC) (Part – I) Examination, 2016 IMAGE PROCESSING (Elective - I)

Marks: 80 Day and Date: Thursday, 8-12-2016

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks. SECTION - I 2. Solve any four:  $(4 \times 5 = 20)$ i) Explain image restoration Model. ii) Explain RGB color Model. iii) Explain smoothing filters. iv) Explain image sampling and quantization. v) Define histogram and explain histogram equalization. 3. i) Explain different type of image acquisition sensors and their parameters. 10 ii) Explain image sharpening in frequency domain. 10 OR 10

ii) Explain dilation and erosion with example.

## SECTION - II

4. Solve any four from the following:

 $(5 \times 4 = 20)$ 

- i) Explain various image redundancy techniques.
- ii) What is error free compression?
- iii) Explain sub band coding technique.
- iv) Explain edge linking technique.
- v) What is fidelity criteria and explain.
- 5. i) Explain the JEPEG coding in detail.

10

ii) Explain the chain coding with an example.

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10

ii) Explain fingerprint recognition as an application in image processing.

Seat						
No.					Set	P
	D.F	(F 0 TO) (Doub	I) <b>F</b>	0010	L	

# **B.E.** (E & TC) (Part – I) Examination, 2016 Elective – I: ADVANCE DIGITAL SIGNAL PROCESSING

Day	and Date	: Thursday, 8-12-2016	Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data, if required.
- Answer Book Page No. 3. Each question carries one mark.
- 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in MCQ/Objective Type Questions **Duration: 30 Minutes** Marks: 20 1. Choose the correct answer:  $(1 \times 20 = 20)$ 1) Wavelet transformation is used for a) Only audio processing b) Only image processing c) Both image + audio processing d) Both video processing + image processing 2) How many complex multiplications are need to be performed for each FFT algorithm? a) (N/2) log N b) Nlog<sub>2</sub>N c)  $(N/2)\log_2 N$ d) None of the above 3) The increase in sampling rate is referred as a) Decimation b) Down sampling d) None of the above c) Interpolator 4) The power spectrum of a given autocorrelation sequence  $r_x(k) = \delta (k-1)$  is a)  $z^{-1}$ b) z c) 0 d) None of the above

5) The Wiener Hopf equation for the FIR Wiener filter is

c)  $r_{dx}^{-1}w = R_x$  d) None a)  $R_x w = r_{dx}$ b)  $r_{dx}w = R_x$ 

6) The frequency response of a system  $h(n) = \delta(n) - \delta(n-1)$  is given by

b)  $1 - e^{jw}$ 

a)  $\delta(w) - \delta(w-1)$ c) u(w) - u(w - 1)

d) None of the above

7) The Noise-Whitening filter for the auto-regressive process is

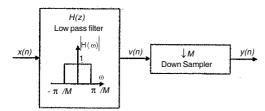
a) All pole system

b) All zero system

c) Pole zero system

d) None

8) Which process has a block diagram as shown in the figure below?



- a) Sampling rate conversion
- b) Interpolation

c) Decimation

- d) None of the mentioned
- 9) The modelling error of  $1^{st}$  order all pole model for a signal x(n) having auto-correlation value  $r_x(0) = 1$ ,  $r_x(1) = 0.5$  is
  - a) 1

- b)  $\frac{1}{2}$
- c) 0
- d)  $\frac{3}{4}$
- 10) For higher values of AR model, order results in
  - a) Smooth waves missing peaks
  - b) Less smooth waves include spurious peaks
  - c) Does not depend on model order
  - d) Depends but smoothing of wave doesn't depend on model order
- 11) AR model is defined for
  - a) Non stationary process
- b) Non white signals

c) Thermal noise

d) None of these

- 12) Weiner filter is
  - a) Conventional filter b) Adaptive filters c) All pole FIR filter d) None of these
- 13) Which among under given is not true for multirate signal processing?
  - a) Decimation
- b) Interpolation
- c) D/I
- d) None of these

- 14) The anti-aliasing filter in a DSP system is a
  - a) Low pass filter
- b) High pass filter c) Band pass filter d) Band stop filter
- 15) The principle of orthogonality is used in
  - a) Multirate signal processing
- b) Wavelet transformation

c) Weiner filtering

- d) Conventional filtering
- 16) Modern day equalization is based on
  - a) Conventional filter b) Digital filters
- c) Adaptive filters d) None of these
- 17) Special-purpose processors can be subdivided into many different groups which are
  - a) Microcontrollers

- b) Digital Signal Processors (DSPs)
- c) Graphics Processing Units (GPUs)
- d) All of the above
- 18) MRA equation is also called
  - a) Modulating equation
- b) FIR filter

c) Dilation equation

- d) Span equation
- 19) In unsampling after every sample placing value is
  - a) 1

- b) 0
- c) 2
- d) 3

- 20) Haar transformation is defined by
  - a)  $T = HFH^T$
- b) T = HFH
- c)  $T = HF^T$
- d)  $T = H^T$



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# **B.E.** (E & TC) (Part – I) Examination, 2016 Elective – I: ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date: Thursday, 8-12-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain applications of multirate systems.
- b) Explain Haar wavelet.
- c) Explain the applications of wavelet transform.
- d) Explain the concept of decimation in multirate signal processing.
- e) Draw the structure of N = 8 point DIF FFT structure.
- 3. Attempt any two of the following:

 $(2 \times 10 = 20)$ 

- a) Describe the sampling rate conversion by a rational factor  $\left(\frac{1}{D}\right)$ .
- b) What are the advantages of polyphase filter structure? Draw the polyphase filter structure with example.
- c) Explain scaling function in wavelets.

# SECTION - II

4. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain the relationship between autocorrelation and the model parameter.
- b) Compare general purpose microprocessors with digital signal processors.
- c) Explain the concept of adaptive filtering.
- d) Explain the Burg method for estimation.
- e) Explain Wiener filter theory.
- 5. Attempt any two of the following:

 $(2\times10=20)$ 

- a) Explain the method of periodogram for the estimation of power density spectrum.
- b) Explain the LMS algorithm in details with suitable example.
- c) Explain with block diagram the computer architecture for signal processing.

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Seat No.					Set Q
	Electiv	B.E. (E & TC) (Part – I) e – I : ADVANCE DIGIT	•		
-	nd Date : Thursdate 3.00 p.m. to 6.00			Max	k. Marks : 100
	Instructions :	<ol> <li>All questions are cor</li> <li>Figures to the right in</li> <li>Assume suitable dat</li> <li>Q. No. 1 is compulsed Answer Book Page N</li> <li>Answer MCQ/Object Don't forget to ment</li> </ol>	ndicate full marks. ta, if required. pry. It should be sol lo. 3. Each question	on carries <b>one</b> n <mark>s on Page I</mark>	mark. <b>No. 3 only.</b>
Durati	on : 30 Minutes	MCQ/Objective T	ype Questions		Marks : 20
	choose the correc	t answer :			(1×20=20
		qualization is based on			(1×20-20
	,	al filter b) Digital filters	c) Adaptive filters	s d) None o	f these
2	a) Microcontro	e processors can be subd ollers rocessing Units (GPUs)	b) Digital Signal	Processors (D	
(	<ul><li>B) MRA equation</li><li>a) Modulating</li><li>c) Dilation eq</li></ul>	equation	b) FIR filter d) Span equation	า	
4	·	after every sample placir	<u>-</u>		
į	a) 1 5) Haar transform a) T = HFH <sup>T</sup>	b) 0 nation is defined by b) T = HFH	c) 2 c) T = HF <sup>T</sup>	<ul><li>d) 3</li><li>d) T = H<sup>T</sup></li></ul>	
(	<ul><li>a) Only audio</li><li>b) Only image</li><li>c) Both image</li></ul>		cessing		
-	7) How many co algorithm ? a) (N/2) log N c) (N/2)log <sub>2</sub> N	mplex multiplications ar	re need to be per b) Nlog <sub>2</sub> N d) None of the at		ach FFT

b) Down samplingd) None of the above

P.T.O.

8) The increase in sampling rate is referred as

a) Decimation

c) Interpolator



- 9) The power spectrum of a given autocorrelation sequence  $r_x(k) = \delta (k-1)$  is
  - a)  $z^{-1}$

b) z

c) 0

- d) None of the above
- 10) The Wiener Hopf equation for the FIR Wiener filter is
  - a)  $R_{y}w = r_{dy}$
- b)  $r_{dx}w = R_x$
- c)  $r_{dx}^{-1}w = R_x$  d) None
- 11) The frequency response of a system  $h(n) = \delta(n) \delta(n-1)$  is given by
  - a)  $\delta(w) \delta(w-1)$

b)  $1 - e^{jw}$ 

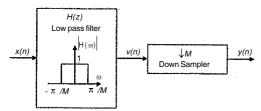
c) u(w) - u(w - 1)

- d) None of the above
- 12) The Noise-Whitening filter for the auto-regressive process is
  - a) All pole system

b) All zero system

c) Pole zero system

- d) None
- 13) Which process has a block diagram as shown in the figure below?



- a) Sampling rate conversion
- b) Interpolation

c) Decimation

- d) None of the mentioned
- 14) The modelling error of  $1^{st}$  order all pole model for a signal x(n) having auto-correlation value  $r_x(0) = 1$ ,  $r_x(1) = 0.5$  is
  - a) 1

- b)  $\frac{1}{2}$
- c) 0
- d)  $\frac{3}{4}$
- 15) For higher values of AR model, order results in
  - a) Smooth waves missing peaks
  - b) Less smooth waves include spurious peaks
  - c) Does not depend on model order
  - d) Depends but smoothing of wave doesn't depend on model order
- 16) AR model is defined for
  - a) Non stationary process
- b) Non white signals

c) Thermal noise

d) None of these

- 17) Weiner filter is
  - a) Conventional filter b) Adaptive filters c) All pole FIR filter d) None of these
- 18) Which among under given is not true for multirate signal processing?
  - a) Decimation
- b) Interpolation
- c) D/I
- d) None of these

- 19) The anti-aliasing filter in a DSP system is a
  - a) Low pass filter
- b) High pass filter c) Band pass filter d) Band stop filter
- 20) The principle of orthogonality is used in
  - a) Multirate signal processing
- b) Wavelet transformation

c) Weiner filtering

d) Conventional filtering



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# B.E. (E & TC) (Part – I) Examination, 2016 Elective – I: ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date: Thursday, 8-12-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Figures to the **right** indicate **full** marks.

3) Assume suitable data, if required.

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain applications of multirate systems.
- b) Explain Haar wavelet.
- c) Explain the applications of wavelet transform.
- d) Explain the concept of decimation in multirate signal processing.
- e) Draw the structure of N = 8 point DIF FFT structure.
- 3. Attempt any two of the following:

 $(2 \times 10 = 20)$ 

- a) Describe the sampling rate conversion by a rational factor  $\left(\frac{1}{D}\right)$ .
- b) What are the advantages of polyphase filter structure? Draw the polyphase filter structure with example.
- c) Explain scaling function in wavelets.

## SECTION - II

4. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain the relationship between autocorrelation and the model parameter.
- b) Compare general purpose microprocessors with digital signal processors.
- c) Explain the concept of adaptive filtering.
- d) Explain the Burg method for estimation.
- e) Explain Wiener filter theory.

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

 $(2\times10=20)$ 

- a) Explain the method of periodogram for the estimation of power density spectrum.
- b) Explain the LMS algorithm in details with suitable example.
- c) Explain with block diagram the computer architecture for signal processing.

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		` , `	t – I) Examination, 2 NGITAL SIGNAL PR		
•	nd Date : Thursday, 3.00 p.m. to 6.00 p.			Max.	Marks: 100
	3) 4)	Figures to the rig Assume suitable Q. No. 1 is comp Answer Book Pa Answer MCQ/O	e compulsory.  ght indicate full marks e data, if required.  pulsory. It should be so age No. 3. Each quest bejective type questi mention, Q.P. Set (P/	olved in <b>first 30 n</b> ion carries <b>one</b> r <b>ons on Page N</b> o	mark. o <b>. 3 only.</b>
		MCQ/Object	ve Type Questions		
Durati	on : 30 Minutes				Marks: 20
1. C	hoose the correct ar	nswer:			(1×20=20)
1	AR model is defin     a) Non stationary     c) Thermal noise	process	b) Non white si d) None of thes	•	
2	<ol> <li>Weiner filter is</li> <li>a) Conventional fi</li> </ol>	lter b) Adaptive t	ilters c) All pole FIR	filterd) None of	these
3	Which among und a) Decimation	der given is not tr b) Interpolati	ue for multirate signal on c) D/I	processing? d) None of	these
4	t) The anti-aliasing a) Low pass filter	•	stem is a filter c) Band pass fi	lter d) Band sto	p filter
5	<ul><li>5) The principle of o</li><li>a) Multirate signa</li><li>c) Weiner filterin</li></ul>	al processing	ed in b) Wavelet tran d) Conventiona		
6	6) Modern day equa	lization is based	on		

a) Conventional filter b) Digital filters c) Adaptive filters d) None of these

7) Special-purpose processors can be subdivided into many different groups which are

a) Microcontrollers

b) Digital Signal Processors (DSPs)

c) Graphics Processing Units (GPUs) d) All of the above

8) MRA equation is also called

a) Modulating equation b) FIR filter

c) Dilation equation d) Span equation

9) In unsampling after every sample placing value is

a) 1 b) 0 c) 2 d) 3

10) Haar transformation is defined by

P.T.O. d)  $T = H^T$ c)  $T = HF^T$ a) T = HFH<sup>T</sup> b) T = HFH

- 11) Wavelet transformation is used for
  - a) Only audio processing
  - b) Only image processing
  - c) Both image + audio processing
  - d) Both video processing + image processing
- 12) How many complex multiplications are need to be performed for each FFT algorithm?
  - a) (N/2) log N

b) Nlog<sub>2</sub>N

c)  $(N/2)\log_2 N$ 

- d) None of the above
- 13) The increase in sampling rate is referred as
  - a) Decimation

b) Down sampling

c) Interpolator

- d) None of the above
- 14) The power spectrum of a given autocorrelation sequence  $r_{\star}(k) = \delta (k-1)$  is
  - a)  $z^{-1}$

b) z

c) 0

- d) None of the above
- 15) The Wiener Hopf equation for the FIR Wiener filter is
  - a)  $R_x w = r_{dx}$
- b)  $r_{dx}w = R_x$
- c)  $r_{dx}^{-1}w = R_x$  d) None
- 16) The frequency response of a system  $h(n) = \delta(n) \delta(n-1)$  is given by
  - a)  $\delta(w) \delta(w-1)$

b)  $1 - e^{jw}$ 

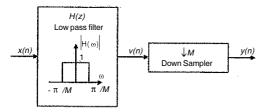
c) u(w) - u(w - 1)

- d) None of the above
- 17) The Noise-Whitening filter for the auto-regressive process is
  - a) All pole system

b) All zero system

c) Pole zero system

- d) None
- 18) Which process has a block diagram as shown in the figure below?



- a) Sampling rate conversion
- b) Interpolation

c) Decimation

- d) None of the mentioned
- 19) The modelling error of 1st order all pole model for a signal x(n) having auto-correlation value  $r_x(0) = 1$ ,  $r_x(1) = 0.5$  is
  - a) 1
- b)  $\frac{1}{2}$
- c) 0
- d)  $\frac{3}{4}$
- 20) For higher values of AR model, order results in
  - a) Smooth waves missing peaks
  - b) Less smooth waves include spurious peaks
  - c) Does not depend on model order
  - d) Depends but smoothing of wave doesn't depend on model order



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# **B.E.** (E & TC) (Part – I) Examination, 2016 Elective – I: ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date: Thursday, 8-12-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Figures to the **right** indicate **full** marks.

3) Assume suitable data, if required.

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain applications of multirate systems.
- b) Explain Haar wavelet.
- c) Explain the applications of wavelet transform.
- d) Explain the concept of decimation in multirate signal processing.
- e) Draw the structure of N = 8 point DIF FFT structure.
- 3. Attempt any two of the following:

 $(2 \times 10 = 20)$ 

- a) Describe the sampling rate conversion by a rational factor  $\left(\frac{1}{D}\right)$ .
- b) What are the advantages of polyphase filter structure? Draw the polyphase filter structure with example.
- c) Explain scaling function in wavelets.

## SECTION - II

4. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain the relationship between autocorrelation and the model parameter.
- b) Compare general purpose microprocessors with digital signal processors.
- c) Explain the concept of adaptive filtering.
- d) Explain the Burg method for estimation.
- e) Explain Wiener filter theory.

5. Attempt any two of the following:

 $(2\times10=20)$ 

- a) Explain the method of periodogram for the estimation of power density spectrum.
- b) Explain the LMS algorithm in details with suitable example.
- c) Explain with block diagram the computer architecture for signal processing.

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Max. Marks: 100

#### **B.E.** (E & TC) (Part – I) Examination, 2016 Elective - I: ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date: Thursday, 8-12-2016

Time: 3.00 p.m. to 6.00 p.m.

- **Instructions**: 1) **All** questions are **compulsory**.
  - 2) Figures to the **right** indicate **full** marks.
  - 3) Assume suitable data, if required.
  - 4) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each guestion carries one mark.
  - 5) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

#### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 20

1. Choose the correct answer:

 $(1 \times 20 = 20)$ 

- 1) The frequency response of a system  $h(n) = \delta(n) \delta(n-1)$  is given by
  - a)  $\delta(w) \delta(w-1)$

b)  $1 - e^{jw}$ 

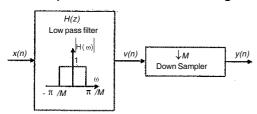
c) u(w) - u(w - 1)

- d) None of the above
- 2) The Noise-Whitening filter for the auto-regressive process is
  - a) All pole system

b) All zero system

c) Pole zero system

- d) None
- 3) Which process has a block diagram as shown in the figure below?



- a) Sampling rate conversion
- b) Interpolation

c) Decimation

- d) None of the mentioned
- 4) The modelling error of  $1^{st}$  order all pole model for a signal x(n) having auto-correlation value  $r_x(0) = 1$ ,  $r_x(1) = 0.5$  is
  - a) 1

- b)  $\frac{1}{2}$
- c) 0
- d)  $\frac{3}{4}$
- 5) For higher values of AR model, order results in
  - a) Smooth waves missing peaks
  - b) Less smooth waves include spurious peaks
  - c) Does not depend on model order
  - d) Depends but smoothing of wave doesn't depend on model order



6)	AR model is defined for a) Non stationary process c) Thermal noise	<ul><li>b) Non white signals</li><li>d) None of these</li></ul>	
7)	Weiner filter is a) Conventional filter b) Adaptive filters	c) All pole FIR filterd) None of these	
8)	Which among under given is not true for a) Decimation b) Interpolation	r multirate signal processing ? c) D/I d) None of these	
9)	The anti-aliasing filter in a DSP system a) Low pass filter b) High pass filter	is a c) Band pass filter d) Band stop filter	
10)	The principle of orthogonality is used in a) Multirate signal processing c) Weiner filtering	b) Wavelet transformation d) Conventional filtering	
11)	Modern day equalization is based on a) Conventional filter b) Digital filters	c) Adaptive filters d) None of these	
12)	<ul><li>Special-purpose processors can be subdita</li><li>a) Microcontrollers</li><li>c) Graphics Processing Units (GPUs)</li></ul>	<ul><li>ivided into many different groups which are</li><li>b) Digital Signal Processors (DSPs)</li><li>d) All of the above</li></ul>	
13)	MRA equation is also called a) Modulating equation c) Dilation equation	<ul><li>b) FIR filter</li><li>d) Span equation</li></ul>	
14)	In unsampling after every sample placin a) 1 b) 0	ng value is c) 2 d) 3	
15)	Haar transformation is defined by a) $T = HFH^T$ b) $T = HFH$	c) $T = HF^T$ d) $T = H^T$	
16)	<ul> <li>Wavelet transformation is used for</li> <li>a) Only audio processing</li> <li>b) Only image processing</li> <li>c) Both image + audio processing</li> <li>d) Both video processing + image processing</li> </ul>	cessing	
17)	algorithm?	re need to be performed for each FFT	
	a) (N/2) log N c) (N/2)log <sub>2</sub> N	<ul><li>b) Nlog<sub>2</sub>N</li><li>d) None of the above</li></ul>	
18)	The increase in sampling rate is referred a) Decimation c) Interpolator	d as b) Down sampling d) None of the above	
19)	The power spectrum of a given autocorr a) $z^{-1}$ c) 0	relation sequence $r_x(k) = \delta (k-1)$ is b) z d) None of the above	
20)	The Wiener Hopf equation for the FIR W a) $R_x w = r_{dx}$ b) $r_{dx} w = R_x$	Viener filter is	



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#### B.E. (E & TC) (Part – I) Examination, 2016 Elective – I: ADVANCE DIGITAL SIGNAL PROCESSING

Day and Date: Thursday, 8-12-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Figures to the **right** indicate **full** marks.

3) Assume suitable data, if required.

#### SECTION - I

2. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain applications of multirate systems.
- b) Explain Haar wavelet.
- c) Explain the applications of wavelet transform.
- d) Explain the concept of decimation in multirate signal processing.
- e) Draw the structure of N = 8 point DIF FFT structure.
- 3. Attempt any two of the following:

 $(2 \times 10 = 20)$ 

- a) Describe the sampling rate conversion by a rational factor  $\left(\frac{1}{D}\right)$ .
- b) What are the advantages of polyphase filter structure? Draw the polyphase filter structure with example.
- c) Explain scaling function in wavelets.

#### SECTION - II

4. Attempt any four of the following:

 $(4 \times 5 = 20)$ 

- a) Explain the relationship between autocorrelation and the model parameter.
- b) Compare general purpose microprocessors with digital signal processors.
- c) Explain the concept of adaptive filtering.
- d) Explain the Burg method for estimation.
- e) Explain Wiener filter theory.
- 5. Attempt **any two** of the following:

 $(2\times10=20)$ 

- a) Explain the method of periodogram for the estimation of power density spectrum.
- b) Explain the LMS algorithm in details with suitable example.
- c) Explain with block diagram the computer architecture for signal processing.

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# **B.E.** (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day	/ and Date :	: Thursday, 24-11-2016	Max. Marks : 100

Time: 3.00 p.m. to 6.00 p.m.

**Instructions**: 1) Q. No. **1** is **compulsory**. It should be solved in **first 30 minutes** in Answer Book Page No. 3. Each guestion carries one mark.

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if required
- 4) Figures to the **right** indicate **full** marks.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 20

Choose the correct answer :

 $(20 \times 1 = 20)$ 

- 1) Gaussian density is also known as
  - a) Estimation density

b) Parameter density

c) Normal density

- d) All of the above
- 2) Which of the following are frequently nearly identical?
  - a) Bayesian, HMM

b) HMM, Maximum Likelihood

c) Newton Descent

- d) Bayesian Maximum Likelihood
- 3) In decision theory an expected loss is called a risk and (  $\alpha_{i|x}$ ) is called the
  - a) Conditional risk

b) Joint risk

c) Marginal risk

- d) None of the above
- 4) Squared Mahalanobis distance from x to  $\mu$  is given by

  - a)  $r^2 = (x \mu)^t \sum -1(x \mu)$ b)  $r^2 = (x + \mu)^t \sum -1(x \mu)$
  - c)  $r^2 = (x + \mu)^t \sum -1(x + \mu)$
- d) None of the above
- 5) Suppose we have an HMM, complete with transition probabilities a<sub>ii</sub> and b<sub>ik</sub>, determine the probability that a particular sequence of visible states V<sub>T</sub> was generated by that model is known as
  - a) The decoding problem
- b) The learning problem
- c) The evaluation problem
- d) None of the above
- 6) What are the problems of dimensionality?
  - a) Accuracy
- b) Dimension
- c) Over fitting
- d) All of the above
- 7) A generalized linear discriminant function is given by
  - a) g(x) = ay

b)  $g(x) = a^t y$ 

c)  $g(x) = ay^t$ 

d) None of the above



8)	<ul><li>The decision region for a Parzon window</li><li>a) Window name</li><li>c) Window width</li></ul>			by classifier depends upon the choice of b) Window function d) None of the above				
9)	The probability dens	ity function for x, giv	,			s denoted by		
	a) $p(x w)$	b) $p(w x)$	c)	p(w)	d)	p(x)		
10)	The density estimati	on in which the volu	ume	e V <sub>n</sub> is shrinked a	cco	ording to function	on	
	$V_n = \frac{1}{\sqrt{n}}$ is called							
	<ul><li>a) Kn-nearest neight</li><li>c) Parzen window</li></ul>	bor		Bayesian estima All of the above	tior	1		
11)	A well formed cluste a) Compact cloud c) Less cloud	r has	,	Dispersed cloud None of these				
12)	Triangle in equality i a) D(a, b) + D(b, c) c b) D(a, b) + D(b, c)	$+ D(b, c) \ge D(a, c)$ b) $D(a, b) + D(b, c) = O(a, c)$						
13)	In k-means clustering, k refers to a) The no. of sample points c) Samples in the cluster			b) The no. of clusters d) None of these				
14)	<ul> <li>In posterior density p(θ D) is called</li> <li>a) Weight vector</li> <li>c) Parameter vector</li> </ul>			<ul><li>b) Threshold vector</li><li>d) All of these</li></ul>				
15)	<ul> <li>A discriminant function g(x) is linear the</li> <li>a) Plane</li> <li>c) Both a) and b)</li> </ul>			s decision surface Hyper plane None of the abov		called		
16)	Parzen window metha) Estimating error rc) Estimating densiti	ate		Estimating neare		neighbor		
17)	If the sequence has that level K, they rema a) Hierarchical clus c) Tree-clustered	in together at all hig	ghe b)	•	uen			
18)	Newton's algorithm i a) Normal	s not applicable if tl b) Singular		Hessian matrix is Either a) or b)	d)	Both a) and b	)	
19)	The solution vector ea) Negative side of c) Both sides		,	Positive side of a		ry hyperplane		
20)	If the overlapping be	tween component	den	sities of normal n	nixt	ure is small the	en	
	the convergence is a) Slow	b) Fast	c)	Moderate	d)	Unchange	Set P	



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# B.E. (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

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

#### SECTION - I

#### 2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define
  - a) Feature space
  - b) Risk.
- d) What is supervised learning?
- e) State and prove Bayes' Theorem.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Explain HMM decoding algorithm.
- b) Explain Bayesian parameter estimation for the case where mean  $\,\mu$  is the only unknown parameter.
- c) Write a note on Bayesian Parameter Estimation.

#### SECTION - II

#### 4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) What are the properties of metrics? Write an expression for Euclidean Distance.
- b) Explain Kn-nearest neighbor estimation. Illustrate with diagrams.



- c) Explain hierarchical clustering.
- d) Explain determinant criteria for clustering.
- e) Explain k-means clustering algorithm.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Compare supervised and unsupervised learning.
- b) Give an expression for linear discriminant function in multicategory case.
- c) Compare between Parzen window and Kn-nearest neighbor estimation.

c) Marginal risk

# **SLR-EP - 471**

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# B.E. (E & TC) (Part – II) (Old) Examination, 2016

	5,2			)		
•	d Date : Thursda 3.00 p.m. to 6.00	•	16		Max. Ma	arks : 100
		Answer E 2) Answer I Don't for 3) Assume S	Book Page No. <b>.</b> <b>MCQ/Objective</b>	•	carries <b>one</b> ma <b>s on Page No.</b> :	rk. <b>3 only.</b>
Duratio	n : 30 Minutes	MCQ/	Objective Type	Questions	N	Marks : 20
1 Ch	oose the correct	answer:			<i>(</i> *	20×1=20)
	Parzen window  a) Estimating 6  c) Estimating 6	method is uerror rate	b)	Estimating near	est neighbor	20X 1=20)
2)		remain toge I clustered	ther at all highe b)	er two samples a r levels, then sec On-line clustere All of the above	quence is said to d	
3)	Newton's algor a) Normal	ithm is not a b) Sin	• •	Hessian matrix is Either a) or b)		lb)
4)	The solution ve a) Negative sid c) Both sides		nyperplane b)	Positive side of None of the abo		ne
5)	If the overlappi the convergence a) Slow	-		nsities of normal  Moderate	mixture is small d) Unchange	then
6)	Gaussian dens a) Estimation o c) Normal den	density	b)	Parameter dens	•	
7)	Which of the fo a) Bayesian, H c) Newton Des	HMM	b)	y identical ? HMM, Maximun Bayesian Maxir		
8)	In decision theoa) Conditional	-		ed a risk and ( $lpha_{ m i}$ Joint risk	x) is called the	

d) None of the above



9)	Squared Mahalanobis distance from x to	ο μ	is given by		
	a) $r^2 = (x - \mu)^t \sum -1(x - \mu)$	b)	$r^2 = (x + \mu)^t \sum_{i=1}^{\infty} -1$	$1(x-\mu)$	
	c) $r^2 = (x + \mu)^t \sum -1(x + \mu)$	d)	None of the above	⁄e	
10)	, — — — — — — — — — — — — — — — — — — —	ars b)	transition probabi equence of visible The learning pro None of the abov	e states V <sub>T</sub> was blem	
11)	What are the problems of dimensionality a) Accuracy b) Dimension		Over fitting	d) All of the abo	ve
12)	A generalized linear discriminant function $g(x) = ay$ c) $g(x) = ay^t$	b)	s given by g(x) = a <sup>t</sup> y None of the abov	⁄e	
13)	The decision region for a Parzon window a) Window name c) Window width	b)	lassifier depends Window function None of the abov	•	of
14)	The probability density function for x, give	/en	that the nature is	w is denoted by	
	a) $p(x w)$ b) $p(w x)$	c)	p(w)	d) p(x)	
15)	The density estimation in which the volu	ıme	e V <sub>n</sub> is shrinked a	ccording to functi	on
	$V_n = \frac{1}{\sqrt{n}}$ is called				
	<ul><li>a) Kn-nearest neighbor</li><li>c) Parzen window</li></ul>		Bayesian estima All of the above	tion	
16)	A well formed cluster has a) Compact cloud c) Less cloud	,	Dispersed cloud None of these		
17)	Triangle in equality is given by a) $D(a, b) + D(b, c) \ge D(a, c)$ c) $D(a, b) + D(b, c) \le O(a, c)$	,	D(a, b) + D(b, c) = O(a, b) - O(b, c)	, ,	
18)	In k-means clustering, k refers to a) The no. of sample points c) Samples in the cluster	,	The no. of cluster	rs	
19)	In posterior density $p(\theta D)$ is called a) Weight vector c) Parameter vector	,	Threshold vector All of these		
20)	A discriminant function g(x) is linear the a) Plane c) Both a) and b)	b)	s decision surface Hyper plane None of the abov		Set Q



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# B.E. (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

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

#### SECTION - I

### 2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define
  - a) Feature space
  - b) Risk.
- d) What is supervised learning?
- e) State and prove Bayes' Theorem.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Explain HMM decoding algorithm.
- b) Explain Bayesian parameter estimation for the case where mean  $\,\mu$  is the only unknown parameter.
- c) Write a note on Bayesian Parameter Estimation.

#### SECTION - II

#### 4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) What are the properties of metrics? Write an expression for Euclidean Distance.
- b) Explain Kn-nearest neighbor estimation. Illustrate with diagrams.



- c) Explain hierarchical clustering.
- d) Explain determinant criteria for clustering.
- e) Explain k-means clustering algorithm.

#### 5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Compare supervised and unsupervised learning.
- b) Give an expression for linear discriminant function in multicategory case.
- c) Compare between Parzen window and Kn-nearest neighbor estimation.


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# B.E. (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if required
- 4) Figures to the right indicate full marks.

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 20

Choose the correct answer :

 $(20 \times 1 = 20)$ 

- 1) A well formed cluster has
  - a) Compact cloud
  - c) Less cloud

- b) Dispersed cloud
- d) None of these
- 2) Triangle in equality is given by
  - a)  $D(a, b) + D(b, c) \ge D(a, c)$
  - c)  $D(a, b) + D(b, c) \le O(a, c)$
- b) D(a, b) + D(b, c) = O(a, c)
- d) O(a, b) O(b, c) > O(a, c)
- 3) In k-means clustering, k refers to
  - a) The no. of sample points
  - c) Samples in the cluster
- b) The no. of clusters
- d) None of these
- 4) In posterior density  $p(\theta | D)$  is called
  - a) Weight vector

b) Threshold vector

c) Parameter vector

- d) All of these
- 5) A discriminant function g(x) is linear then its decision surface is called
  - a) Plane

b) Hyper plane

c) Both a) and b)

- d) None of the above
- 6) Parzen window method is used for
  - a) Estimating error rate

b) Estimating nearest neighbor

c) Estimating density

- d) All of the above
- 7) If the sequence has the property that whenever two samples are in the same cluster at level K, they remain together at all higher levels, then sequence is said to be
  - a) Hierarchical clustered
- b) On-line clustered

c) Tree-clustered

- d) All of the above
- 8) Newton's algorithm is not applicable if the Hessian matrix is
  - a) Normal
- b) Singular
- c) Either a) or b)
- d) Both a) and b)



9)	The solution vector exists a) Negative side of every		Positive side of e	every hynernlane	
	c) Both sides		None of the above		
10)	If the overlapping between the convergence is	-			en
	a) Slow b) Fa	·	Moderate	d) Unchange	
11)	<ul><li>Gaussian density is also k</li><li>a) Estimation density</li><li>c) Normal density</li></ul>	b)	Parameter densi All of the above	ty	
12)	Which of the following are a) Bayesian, HMM c) Newton Descent	b)	<sup>,</sup> identical ? HMM, Maximum Bayesian Maxim		
13)	In decision theory an expe a) Conditional risk c) Marginal risk	b)	d a risk and ( $lpha_{i }$ ) Joint risk None of the abov		
14)	Squared Mahalanobis distant a) $r^2 = (x - \mu)^t \sum -1(x - \mu)^t r^2 = (x + \mu)^t \sum -1(x + \mu)^t r^2 r^2$			1(x – μ) ve	
15)	Suppose we have an HMM determine the probability to generated by that model is a) The decoding problem c) The evaluation problem	hat a particular s s known as b)	transition probable equence of visible The learning pro	e states V <sub>T</sub> was	
16)	What are the problems of a) Accuracy b) D		Over fitting	d) All of the above	/e
17)	A generalized linear discri a) $g(x) = ay$ c) $g(x) = ay^t$	b)	s given by g(x) = a <sup>t</sup> y None of the abov	ve	
18)	The decision region for a R a) Window name c) Window width	b)	lassifier depends Window function None of the abov	l	of
19)	The probability density fun a) $p(x w)$ b) $p($	i i		w is denoted by d) p(x)	
20)	The density estimation in	which the volume	e V <sub>n</sub> is shrinked a	ccording to function	on
	$V_n = \frac{1}{\sqrt{n}}$ is called				
	<ul><li>a) Kn-nearest neighbor</li><li>c) Parzen window</li></ul>	•	Bayesian estima All of the above	ition	Set R



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# B.E. (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

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

#### SECTION - I

### 2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define
  - a) Feature space
  - b) Risk.
- d) What is supervised learning?
- e) State and prove Bayes' Theorem.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Explain HMM decoding algorithm.
- b) Explain Bayesian parameter estimation for the case where mean  $\,\mu$  is the only unknown parameter.
- c) Write a note on Bayesian Parameter Estimation.

#### SECTION - II

#### 4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) What are the properties of metrics? Write an expression for Euclidean Distance.
- b) Explain Kn-nearest neighbor estimation. Illustrate with diagrams.



- c) Explain hierarchical clustering.
- d) Explain determinant criteria for clustering.
- e) Explain k-means clustering algorithm.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Compare supervised and unsupervised learning.
- b) Give an expression for linear discriminant function in multicategory case.
- c) Compare between Parzen window and Kn-nearest neighbor estimation.

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# **B.E.** (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date:	Thursday, 24-11-2016	Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

- 2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
- 3) Assume suitable data if required
- 4) Figures to the right indicate full marks.

### MCQ/Objective Type Questions

Dur	atio	n : 30 Minutes				Marks : 20
1.	Ch	oose the correct ans	wer:			(20×1=20)
	1)	What are the proble a) Accuracy	ems of dimensional b) Dimension	ity ? c) Over fitting	d) All of t	the above
	2)	A generalized linea a) $g(x) = ay$ c) $g(x) = ay^t$	r discriminant func	tion is given by b) g(x) = a <sup>t</sup> y d) None of the ab	oove	
	3)	The decision region a) Window name c) Window width	n for a Parzon wind	ow classifier depend b) Window functi d) None of the ab	on	choice of
	4)	The probability dens	sity function for x, g	given that the nature	is w is deno	ted by

5) The density estimation in which the volume  $\boldsymbol{V}_{n}$  is shrinked according to function

c) p(w)

$$V_n = \frac{1}{\sqrt{n}}$$
 is called

- a) Kn-nearest neighbor b) Bayesian estimation c) Parzen window d) All of the above
- 6) A well formed cluster has a) Compact cloud b) Dispersed cloud c) Less cloud d) None of these

b) p(w|x)

- 7) Triangle in equality is given by a)  $D(a, b) + D(b, c) \ge D(a, c)$ b) D(a, b) + D(b, c) = O(a, c)c)  $D(a, b) + D(b, c) \leq O(a, c)$ d) O(a, b) - O(b, c) > O(a, c)8) In k-means clustering, k refers to
  - a) The no. of sample points b) The no. of clusters c) Samples in the cluster d) None of these

<ul> <li>9) In posterior density p(θ D) is called <ul> <li>a) Weight vector</li> <li>b) Threshold vector</li> <li>c) Parameter vector</li> <li>d) All of these</li> </ul> </li> <li>10) A discriminant function g(x) is linear then its decision surface is called <ul> <li>a) Plane</li> <li>b) Hyper plane</li> <li>c) Both a) and b)</li> <li>d) None of the above</li> </ul> </li> </ul>	olustas.
c) Parameter vector d) All of these  10) A discriminant function g(x) is linear then its decision surface is called a) Plane b) Hyper plane c) Both a) and b) d) None of the above	olustes.
10) A discriminant function g(x) is linear then its decision surface is called a) Plane b) Hyper plane c) Both a) and b) d) None of the above	olustas.
a) Plane b) Hyper plane c) Both a) and b) d) None of the above	olustas.
c) Both a) and b) d) None of the above	olustas.
11) Parzen window method is used for	. aluetee
a) Estimating error rate b) Estimating nearest neighbor	
c) Estimating density d) All of the above	وملاميناه و
<ul> <li>12) If the sequence has the property that whenever two samples are in the same at level K, they remain together at all higher levels, then sequence is sai</li> <li>a) Hierarchical clustered</li> <li>b) On-line clustered</li> <li>c) Tree-clustered</li> <li>d) All of the above</li> </ul>	
13) Newton's algorithm is not applicable if the Hessian matrix is	
a) Normal b) Singular c) Either a) or b) d) Both a) a	and b)
14) The solution vector exists on	
a) Negative side of every hyperplane b) Positive side of every hyperp	lane
c) Both sides d) None of the above	all than
15) If the overlapping between component densities of normal mixture is sm the convergence is	an men
a) Slow b) Fast c) Moderate d) Unchang	ge
16) Gaussian density is also known as	-
a) Estimation density b) Parameter density	
c) Normal density d) All of the above	
17) Which of the following are frequently nearly identical?	
a) Bayesian, HMM b) HMM, Maximum Likelihood	- d
c) Newton Descent d) Bayesian Maximum Likelihoo	Ju
18) In decision theory an expected loss is called a risk and ( $\alpha_{\rm i } {\bf x})$ is called the	е
a) Conditional risk b) Joint risk	
c) Marginal risk d) None of the above	
19) Squared Mahalanobis distance from x to $\mu$ is given by	
a) $r^2 = (x - \mu)^t \sum -1(x - \mu)$ b) $r^2 = (x + \mu)^t \sum -1(x - \mu)$	
c) $r^2 = (x + \mu)^t \sum -1(x + \mu)$ d) None of the above	
20) Suppose we have an HMM, complete with transition probabilities $\mathbf{a}_{ij}$ and determine the probability that a particular sequence of visible states $V_T$ we generated by that model is known as	b <sub>jk</sub> , ⁄as
a) The decoding problem b) The learning problem c) The evaluation problem d) None of the above	



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# B.E. (E & TC) (Part – II) (Old) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

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

#### SECTION - I

### 2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define
  - a) Feature space
  - b) Risk.
- d) What is supervised learning?
- e) State and prove Bayes' Theorem.

#### 3. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Explain HMM decoding algorithm.
- b) Explain Bayesian parameter estimation for the case where mean  $\,\mu$  is the only unknown parameter.
- c) Write a note on Bayesian Parameter Estimation.

#### SECTION - II

#### 4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) What are the properties of metrics? Write an expression for Euclidean Distance.
- b) Explain Kn-nearest neighbor estimation. Illustrate with diagrams.



- c) Explain hierarchical clustering.
- d) Explain determinant criteria for clustering.
- e) Explain k-means clustering algorithm.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) Compare supervised and unsupervised learning.
- b) Give an expression for linear discriminant function in multicategory case.
- c) Compare between Parzen window and Kn-nearest neighbor estimation.

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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Day and Date: Thursday, 24-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

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

# **MCQ/Objective Type Questions**

Duration: 30 Minutes Marks: 20

1. Choose the correct answer:

 $(20 \times 1 = 20)$ 

1) De-morgan's principle can be defined as

a) 
$$\overline{A \cap B} = \overline{A} \cap \overline{B}$$
 b)  $\overline{A \cap B} = \overline{A} \cup \overline{B}$  c)  $\overline{A \cup B} = \overline{A} \cup \overline{B}$  d) None

2) When the universe X is discrete and finite, then the notation convention for fuzzy set  $\overset{A}{\sim}$  is given as

a) 
$$\tilde{A} = \left\{ \int \frac{\mu_{\tilde{A}}(x)}{x} \right\}$$

$$p) \tilde{V} = \left\{ \frac{dx}{dx} \frac{x}{\tilde{h}^{\tilde{V}}(x)} \right\}$$

c) 
$$\tilde{A} = \sum_{i} \frac{\mu_{\tilde{A}}(x_{i})}{x_{i}}$$

d) None

- 3) A tolerance relation R is also called as \_\_\_\_\_ relation.
  - a) Equivalence
- b) Proximity
- c) Both a) and b) d) None
- 4) Lambda cut obey the property

a) 
$$\left( \underbrace{A} \cup \underbrace{B}_{\lambda} \right)_{\lambda} = A_{\lambda} \cup B_{\lambda}$$

b) 
$$\left( \tilde{A} \cup \tilde{B} \right)_{\lambda} = \tilde{A}_{\lambda} \cap B_{\lambda}$$

c) 
$$\left(\tilde{A} \cap \tilde{B}\right)_{\lambda} = A_{\lambda} \cup B_{\lambda}$$

d) None

- 5) Membership value assignment includes
  - a) Intuition
- b) Inference
- c) Rank ordering d) All
- 6) In inductive reasoning, the membership function can be created as \_\_\_\_\_\_ generation.
  - a) Manual
- b) Automatic
- c) Both a) and b) d) None



7)	Interval arithmetic f a) Associativity			Distributivity	d)	Both a) and b)
8)	Approximate metho a) Discrete valued c) Continuous	ods of extension m	b)	ly used for Random None		function.
9)	Feature analysis co a) Nomination	mponents are b) Selection	c)	Extraction	d)	All of these
10)	Pattern recognition a) design				d)	a) or b)
11)		se in decision grou	p.	•		
	a) Consensus	b) Preference	c)	Both a) and b)	d)	None
12)	For general form, de of decision measur	e where it includes	3	·		
	<ul><li>a) Objective</li><li>c) Preference and</li></ul>	consensus	b) d)	Importance of or Both a) and b)	•	
13)	Non-transitive rank a) Crisp	ing is b)  Cardinal	c)	ncepts. Non-cardinal	d)	None
14)	Physical system ur a) Project	nder control is calle b) Process	ed c)	Plant	d)	Sensor
15)	With random varia	bles we can quan	ntify	the uncertainty	in	ordering with a
	a) Convolution difference Sum		ď)	None		
16)				\		
.0)	Average certainty i	$n \stackrel{R}{\sim} is defined as$	c(I	ੋ )=		
10)	Average certainty in a) $\frac{\text{tr}(R^2)}{n(n-1)}$	b) $\frac{R}{n} \text{ is defined as}$ $\frac{\operatorname{tr} \left( RR^{T} \right)}{n (n-1)/2}$	c(F	$\frac{R}{n} = \frac{\operatorname{tr}(R)}{n(n-1)/2}$	d)	None
	The optimum decis	ion a*, for multiobj	ject	ive decision ma	kinç	$g \mu_D (a^*) =$
		ion a*, for multiobj	ject	ive decision ma	kinç	$g \mu_D (a^*) =$
17)	The optimum decis	ion a*, for multiobj b) $\min_{a \in A} (\mu_D(a))$	ject c)	ive decision ma Both a) and b)	king d)	g μ <sub>D</sub> (a *) = None
17)	The optimum decise a) $\max_{a \in A} (\mu_D(a))$ In linear programmi	ion $a^*$ , for multiobj b) $\min_{a \in A} (\mu_D(a))$ ng problem, the fu	ject c) ncti b)	ive decision ma Both a) and b)	kin( d) zed	g μ <sub>D</sub> (a *) = None
17) 18)	The optimum decise $a$ ) $\max_{a \in A} (\mu_D(a))$ In linear programmicalled $a$ ) Constraint matric $c$ ) Linear function	ion $a^*$ , for multiobj $b$ ) $\displaystyle \min_{a \in A} \left( \mu_D \left( a \right) \right)$ $ng$ problem, the fu $x$	c) ncti b) d)	ive decision ma Both a) and b) ion to be minimiz Objective funct None	kin( d) zed	g μ <sub>D</sub> (a *) = None
17) 18)	The optimum decise a) $\max_{a \in A} (\mu_D(a))$ In linear programmic called a) Constraint matri	ion $a^*$ , for multiobjet $b$ ) $\displaystyle \min_{a \in A} \left( \mu_D \left( a \right) \right)$ and problem, the fuctors $x$	c) ncti b) d)	ive decision ma Both a) and b) ion to be minimiz Objective funct None	king d) zed ion	g μ <sub>D</sub> (a *) =  None  or maximized is



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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m to 6.00 p.m.

#### SECTION-I

2. Solve any four:

 $(4 \times 5 = 20)$ 

Marks: 80

- a) What is  $\lambda$  cut? Prove the property of associativity.
- b) With extended Venn diagram prove excluded middle axioms.
- c) Explain image enhancement using fuzzy logic.
- d) If fuzzy set  $\underline{A}$  and  $\underline{B}$  are represented as follows, find  $\overline{\underline{A}}$ ,  $\underline{A} | \underline{B}$ ,  $\underline{B} | A$ ,

$$\tilde{A} = \left\{ \frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\}, \ \tilde{B} = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}.$$

- e) Explain fuzzy set extension principle.
- 3. a) Explain fuzzy automata in detail.

 $(1 \times 10 = 10)$ 

b) If 
$$R_{\tilde{L}_1} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$$
 is reflexive and symmetric . Prove that

$$R_{-1}^4 = R_1 \ 0 \ R_1 \ 0 R_1 \ 0 R_1 = R_1 \ i.e. \text{ transitivity results.}$$
 (1×10=10)

OR

- b) Develop fuzzy membership function for fuzzy number "approximately 2 and approximately 6" using following function shape:
  - a) Symmetric triangle
  - b) Trapezoid.

# 

#### SECTION - II

4. Answer any four:

 $(4 \times 5 = 20)$ 

- a) Explain simple fuzzy control.
- b) Explain neuro fuzzy system.
- c) What is fuzzy cognitive map?
- d) Write a short note on fuzzy regression.
- e) Explain fuzzy expert system.
- 5. a) The professional photographers are asked to suggest the best camera between models of ABCD. The pairwise comparison/relation matrix is

$$R = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$
 determine average fuzziness and average certainty.

 $(1 \times 10 = 10)$ 

- b) Explain:
  - i) Fuzzy ordering
  - ii) Multiobjective decision.

 $(1 \times 10 = 10)$ 

OR

b) What is SPC? Explain in detail measurement and attribute SPC.

# **SLR-EP - 472**

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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Day and Date: Thursday, 24-11-2016 Max. Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

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

### MCQ/Objective Type Questions

**Duration: 30 Minutes** Marks: 20

1. Choose the correct answer:

 $(20 \times 1 = 20)$ 

1) Average certainty in  $\stackrel{R}{\sim}$  is defined as  $c(\stackrel{R}{\sim}) =$ 

a) 
$$\frac{\operatorname{tr}\left(R^{2}\right)}{n\left(n-1\right)}$$

a) 
$$\frac{\operatorname{tr}\left(R^{2}\right)}{n\left(n-1\right)}$$
 b)  $\frac{\operatorname{tr}\left(RR^{T}\right)}{n\left(n-1\right)/2}$  c)  $\frac{\operatorname{tr}\left(R\right)}{n\left(n-1\right)/2}$  d) None

c) 
$$\frac{\text{tr}(R)}{n(n-1)/2}$$

- 2) The optimum decision  $a^*$ , for multiobjective decision making  $\mu_D$  ( $a^*$ ) =
  - a)  $\max_{a \in A} (\mu_D(a))$  b)  $\min_{a \in A} (\mu_D(a))$  c) Both a) and b) d) None

- 3) In linear programming problem, the function to be minimized or maximized is called
  - a) Constraint matrix

b) Objective function

c) Linear function

- d) None
- 4) A common SPC technique use \_\_\_\_\_ charts.
  - a)  $\overline{X} R$
- b) P
- c) R
- d)  $X \overline{R}$
- 5) Genetic algorithm usually used for \_\_\_\_\_ solution.
  - a) Average
- b) Minimum
- c) Optimum
- d) None
- 6) De-morgan's principle can be defined as
  - a)  $\overline{A \cap B} = \overline{A} \cap \overline{B}$  b)  $\overline{A \cap B} = \overline{A} \cup \overline{B}$  c)  $\overline{A \cup B} = \overline{A} \cup \overline{B}$  d) None



,	When the unfuzzy set A			nd finite, then	the notation conven	tion for
	•	3	-	3		

a) $\tilde{A} = \left\{ \int \frac{x}{\mu_{\tilde{A}}(x)} \right\}$ b) $\tilde{A} =$	$\left\{\frac{d}{dx}\frac{\mu_{\tilde{A}}\left(x\right)}{x}\right\}$	$\rightarrow c)  \overset{\triangle}{A} = \sum_{i} \frac{\mu_{\overset{\triangle}{A}}(x_{i})}{x_{i}}  d) \text{ None}$
--	--	--

		L.	J	L	J	
8)	A tolerar	nce relatio	on R is also	called as		relation.

- a) Equivalence b) Proximity
- c) Both a) and b) d) None

<b>~</b> \		
9	Lambda cut obe	y the property

a) 
$$\left( \underbrace{A} \cup \underbrace{B} \right)_{\lambda} = A_{\lambda} \cup B_{\lambda}$$

b) 
$$\left( \tilde{A} \cup \tilde{B} \right)_{\lambda} = \tilde{A}_{\lambda} \cap B_{\lambda}$$

c) 
$$\left(\tilde{A} \cap \tilde{B}\right)_{\lambda} = A_{\lambda} \cup B_{\lambda}$$

d) None

10)	Membership	value assignr	nent includes

- a) Intuition
- b) Inference
- c) Rank ordering d) All
- 11) In inductive reasoning, the membership function can be created as \_\_\_\_\_\_ generation.
  - a) Manual
- b) Automatic
- c) Both a) and b) d) None

12) Interval arithmetic follows property of

- a) Associativity
- b) Commutativity c) Distributivity d) Both a) and b)
- 13) Approximate methods of extension mostly used for \_\_\_\_\_ function. a) Discrete valued
  - b) Random

c) Continuous

d) None

14) Feature analysis components are

- a) Nomination
- b) Selection
- c) Extraction d) All of these

15) Pattern recognition data is of following type

- a) design
- b) test
- c) both a) and b) d) a) or b)

16) Scalar measure of "degree of consensus" is produced from individual of those in decision group.

- a) Consensus
- b) Preference
- c) Both a) and b) d) None

17) For general form, decision function (D) is function represented as intersection of decision measure where it includes

a) Objective

- b) Importance of objective
- c) Preference and consensus
- d) Both a) and b)

18) Non-transitive ranking is concepts.

- a) Crisp
- b) Cardinal
- c) Non-cardinal d) None

19) Physical system under control is called

- a) Project
- b) Process
- c) Plant
- d) Sensor

20) With random variables we can quantify the uncertainty in ordering with a

- a) Convolution differentiation
- b) Convolutional integral

c) Sum

d) None



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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m to 6.00 p.m.

SECTION - I

2. Solve any four: (4×5=20)

- a) What is  $\lambda$  cut? Prove the property of associativity.
- b) With extended Venn diagram prove excluded middle axioms.
- c) Explain image enhancement using fuzzy logic.
- d) If fuzzy set  $\underline{A}$  and  $\underline{B}$  are represented as follows, find  $\overline{\underline{A}}$ ,  $\underline{A} | \underline{B}$ ,  $\underline{B} | A$ ,

$$\tilde{A} = \left\{ \frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\}, \ \tilde{B} = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}.$$

- e) Explain fuzzy set extension principle.
- 3. a) Explain fuzzy automata in detail.

 $(1 \times 10 = 10)$ 

Marks: 80

b) If 
$$R_{\tilde{L}_1} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$$
 is reflexive and symmetric . Prove that

$$R_{-1}^4 = R_1 \ 0 \ R_1 \ 0 R_1 \ 0 R_1 = R_1 \ i.e. \text{ transitivity results.}$$
 (1×10=10)

OR

- b) Develop fuzzy membership function for fuzzy number "approximately 2 and approximately 6" using following function shape:
  - a) Symmetric triangle
  - b) Trapezoid.

# 

#### SECTION - II

4. Answer any four:

 $(4 \times 5 = 20)$ 

- a) Explain simple fuzzy control.
- b) Explain neuro fuzzy system.
- c) What is fuzzy cognitive map?
- d) Write a short note on fuzzy regression.
- e) Explain fuzzy expert system.
- 5. a) The professional photographers are asked to suggest the best camera between models of ABCD. The pairwise comparison/relation matrix is

$$R = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$
 determine average fuzziness and average certainty.

 $(1 \times 10 = 10)$ 

- b) Explain:
  - i) Fuzzy ordering
  - ii) Multiobjective decision.

 $(1 \times 10 = 10)$ 

OR

b) What is SPC? Explain in detail measurement and attribute SPC.



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	B.E. (E & TC) (Part – FUZZY LOGIC (E	II) Examination, 2 Elective – II) (Old)	
•	d Date : Thursday, 24-11-2016 3.00 p.m. to 6.00 p.m.		Max. Marks: 100
,	carries <b>one</b> mark. 2) <b>Answer MCQ/Obj</b>	swer Book Page No.	3. Each question  ns on Page No. 3
		Type Questions	
Duratio	on : 30 Minutes		Marks : 20
	oose the correct answer :		(20×1=20)
·	•	oup. c) Both a) and b)	d) None
2)	For general form, decision function (I of decision measure where it include a) Objective c) Preference and consensus	es b) Importance of	
3)	Non-transitive ranking isa) Crisp b) Cardinal	_ concepts. c) Non-cardinal	d) None
4)	Physical system under control is ca a) Project b) Process	lled c) Plant	d) Sensor
5)	With random variables we can qua	antify the uncertainty	y in ordering with a
	a) Convolution differentiation c) Sum	b) Convolutional i d) None	ntegral
6)	Average certainty in $\overset{R}{\sim}$ is defined as	s c(R) =	
	a) $\frac{\operatorname{tr}(\mathbb{R}^2)}{\operatorname{n}(n-1)}$ b) $\frac{\operatorname{tr}(\mathbb{R}\mathbb{R}^T)}{\operatorname{n}(n-1)/2}$	c) $\frac{\operatorname{tr}(R)}{\operatorname{n}(n-1)/2}$	d) None

- 7) The optimum decision  $a^{\star},$  for multiobjective decision making  $\mu_{D}$  (a  $^{\star})$  =

  - a)  $\max_{a \in A} \left( \mu_D \left( a \right) \right)$  b)  $\min_{a \in A} \left( \mu_D \left( a \right) \right)$  c) Both a) and b) d) None



8)	In linear programmi called	ng problem, the fu	nct	ion to be minimiz	zed	or maximized	is
	<ul><li>a) Constraint matri</li><li>c) Linear function</li></ul>	X	•	Objective funct None	ion		
9)	A common SPC ted	hnique use		charts.			
	a) $\overline{X} - R$	b) P	c)	R	d)	$X - \overline{R}$	
10)	Genetic algorithm u a) Average	sually used for b) Minimum				None	
11)	De-morgan's princi	ple can be defined	as				
	a) $\overline{A \cap B} = \overline{A} \cap \overline{B}$	b) $\overline{A \cap B} = \overline{A} \cup \overline{B}$	3 (	$\overline{A \cup B} = \overline{A} \cup \overline{I}$	В	d) None	
12)	When the universe	X is discrete and	fini	te, then the nota	tior	n convention f	or
	fuzzy set $\overset{A}{\sim}$ is give	n as					
	a) $\tilde{A} = \left\{ \int \frac{\mu_{\tilde{A}}(x)}{x} \right\}$		b)	$\tilde{A} = \begin{cases} \frac{d}{dx} \frac{\mu_{\tilde{A}}(x)}{x} \end{cases}$	)		
	c) $\tilde{A} = \sum_{i} \frac{\mu_{\tilde{A}}(x_{i})}{x_{i}}$		d)	None			
13)	A tolerance relation a) Equivalence	nRis also called as b) Proximity		relation Both a) and b)		None	
14)	Lambda cut obey th	ne property					
	a) $\left( \underbrace{A} \cup \underbrace{B} \right)_{\lambda} = A_{\lambda}$		b)	$\left(\tilde{A} \cap \tilde{B}\right)^{\gamma} = \tilde{A}^{\gamma}$	. ^	$B_\lambda$	
	c) $\left(\tilde{A} \cap \tilde{B}\right)_{\lambda} = A_{\lambda}$	$\cup$ B $_{\lambda}$	d)	None			
15)	Membership value a) Intuition	_		Rank ordering	d)	All	
16)	In inductive reasonir	ng, the membership	fur	nction can be crea	atec	las	_ <del>.</del>
	generation. a) Manual	b) Automatic	c)	Both a) and b)	d)	None	
17)	Interval arithmetic f a) Associativity	ollows property of	,	, ,	,		<b>)</b> )
18)	Approximate metho a) Discrete valued c) Continuous	ods of extension m	b)	ly used for Random None		function.	
19)	Feature analysis co a) Nomination	•	c)	Extraction	d)	All of these	
20)	Pattern recognition a) design	data is of following b) test		pe both a) and b)	d)	a) or b)	Set R



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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m to 6.00 p.m.

#### SECTION-I

2. Solve any four: (4×5=20)

- a) What is  $\lambda$  cut? Prove the property of associativity.
- b) With extended Venn diagram prove excluded middle axioms.
- c) Explain image enhancement using fuzzy logic.
- d) If fuzzy set  $\underline{A}$  and  $\underline{B}$  are represented as follows, find  $\overline{\underline{A}}$ ,  $\underline{A} | \underline{B}$ ,  $\underline{B} | A$ ,

$$\tilde{A} = \left\{ \frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\}, \ \tilde{B} = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}.$$

- e) Explain fuzzy set extension principle.
- 3. a) Explain fuzzy automata in detail.

 $(1 \times 10 = 10)$ 

Marks: 80

b) If 
$$R_{\tilde{L}_1} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$$
 is reflexive and symmetric . Prove that

$$R_{-1}^4 = R_1 \ 0 \ R_1 \ 0 R_1 \ 0 R_1 = R_1 \ i.e. \text{ transitivity results.}$$
 (1×10=10)

OR

- b) Develop fuzzy membership function for fuzzy number "approximately 2 and approximately 6" using following function shape:
  - a) Symmetric triangle
  - b) Trapezoid.



#### SECTION - II

4. Answer any four:

 $(4 \times 5 = 20)$ 

- a) Explain simple fuzzy control.
- b) Explain neuro fuzzy system.
- c) What is fuzzy cognitive map?
- d) Write a short note on fuzzy regression.
- e) Explain fuzzy expert system.
- 5. a) The professional photographers are asked to suggest the best camera between models of ABCD. The pairwise comparison/relation matrix is

$$R = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$
 determine average fuzziness and average certainty.

 $(1 \times 10 = 10)$ 

- b) Explain:
  - i) Fuzzy ordering
  - ii) Multiobjective decision.

 $(1 \times 10 = 10)$ 

OR

b) What is SPC? Explain in detail measurement and attribute SPC.

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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Time: 3.00 p.m. to 6.00 p.m.

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

	0		ective type questic to mention, Q.P.	ons on Page No. 3 Set (P/Q/R/S) on	
<b>.</b>	00 M2	MCQ/Objective 7	Гуре Questions		00
Duratio	on : 30 Minutes			Mark	s:20
1. Ch	noose the correct an	swer:		(20×	1=20)
1)	In inductive reasoning generation.  a) Manual		p function can be cre c) Both a) and b)		_
2)	Interval arithmetic a) Associativity			d) Both a) and b)	)
3)	Approximate methors <ul><li>a) Discrete valued</li><li>c) Continuous</li></ul>		nostly used for b) Random d) None	function.	
4)	Feature analysis co a) Nomination	omponents are b) Selection	c) Extraction	d) All of these	
5)	Pattern recognition a) design			d) a) or b)	
6)	_	se in decision grou	up.		al
	a) Consensus	•	c) Both a) and b)	·	
7)	For general form, d of decision measur a) Objective c) Preference and	re where it include	s b) Importance of	objective	n
8)	Non-transitive rank a) Crisp	ing is b) Cardinal	_concepts. c) Non-cardinal	d) None	
9)	Physical system un a) Project		led c) Plant	d) Sensor	



10)	With random varia	ables we can quar	ntify	the uncertainty	in	ordering with a
	a) Convolution diff c) Sum		d)	None	nteg	gral
11)	Average certainty	in $\frac{R}{\tilde{z}}$ is defined as	c	R )=		
	a) $\frac{\operatorname{tr}\left(R^{2}\right)}{n\left(n-1\right)}$				d)	None
12)	The optimum decis	sion a*, for multiob	ject	ive decision ma	kinç	$g \mu_D (a^*) =$
	a) $\max_{a \in A} (\mu_D(a))$	b) $\min_{a \in A} (\mu_D (a))$	c)	Both a) and b)	d)	None
13)	In linear programm called	ing problem, the fu	ınct	ion to be minimiz	zed	or maximized is
	<ul><li>a) Constraint mate</li><li>c) Linear function</li></ul>	rix	b) d)	Objective funct None	ion	
14)	A common SPC te					
	a) $\overline{X} - R$	b) P	c)	R	d)	$X - \overline{R}$
15)	Genetic algorithm (a) Average	usually used for b) Minimum	c)	solution. Optimum	d)	None
16)	De-morgan's princ	iple can be defined	las			
	a) $\overline{A \cap B} = \overline{A} \cap \overline{B}$	b) $\overline{A \cap B} = \overline{A} \cup \overline{B}$	3 (	c) $\overline{A \cup B} = \overline{A} \cup \overline{I}$	3 (	d) None
17)	When the universe	X is discrete and	fini	te, then the nota	tior	n convention for
	fuzzy set A is give	en as				
	a) $\tilde{A} = \left\{ \int \frac{\mu_{\tilde{A}}(x)}{x} \right\}$		b)	$\tilde{A} = \begin{cases} \frac{d}{dx} \frac{\mu_{\tilde{A}}(x)}{x} \end{cases}$	)	
	c) $\tilde{A} = \sum_{i} \frac{\mu_{\tilde{A}}(x_{i})}{x_{i}}$		d)	None		
18)	A tolerance relation a) Equivalence	n R is also called a b) Proximity		relation Both a) and b)		None
19)	Lambda cut obey t					
	a) $\left(\tilde{A} \cup \tilde{B}\right)_{\lambda} = A_{\lambda}$		b)	$\left(\tilde{A} \cap \tilde{B}\right)^{\gamma} = \tilde{A}^{\gamma}$	_	$B_\lambda$
	c) $\left(\tilde{A} \cap \tilde{B}\right)_{\lambda} = A_{\lambda}$	$_{\lambda}\cupB_{\lambda}$	d)	None		
20)	Membership value a) Intuition			Rank ordering	d)	All



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# B.E. (E & TC) (Part – II) Examination, 2016 FUZZY LOGIC (Elective – II) (Old)

Day and Date: Thursday, 24-11-2016

Time: 3.00 p.m to 6.00 p.m.

### SECTION - I

2. Solve any four: (4×5=20)

- a) What is  $\lambda$  cut? Prove the property of associativity.
- b) With extended Venn diagram prove excluded middle axioms.
- c) Explain image enhancement using fuzzy logic.
- d) If fuzzy set  $\underline{A}$  and  $\underline{B}$  are represented as follows, find  $\overline{\underline{A}}$ ,  $\underline{A} | \underline{B}$ ,  $\underline{B} | A$ ,

$$\tilde{A} = \left\{ \frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\}, \ \tilde{B} = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}.$$

- e) Explain fuzzy set extension principle.
- 3. a) Explain fuzzy automata in detail.

 $(1 \times 10 = 10)$ 

Marks: 80

b) If 
$$R_{\tilde{L}_1} = \begin{bmatrix} 1 & 0.8 & 0 & 0.1 & 0.2 \\ 0.8 & 1 & 0.4 & 0 & 0.9 \\ 0 & 0.4 & 1 & 0 & 0 \\ 0.1 & 0 & 0 & 1 & 0.5 \\ 0.2 & 0.9 & 0 & 0.5 & 1 \end{bmatrix}$$
 is reflexive and symmetric . Prove that

$$R_{-1}^4 = R_1 \ 0 \ R_1 \ 0 R_1 \ 0 R_1 = R_1 \ i.e. \text{ transitivity results.}$$
 (1×10=10)

OR

- b) Develop fuzzy membership function for fuzzy number "approximately 2 and approximately 6" using following function shape:
  - a) Symmetric triangle
  - b) Trapezoid.



#### SECTION - II

4. Answer any four:

 $(4 \times 5 = 20)$ 

- a) Explain simple fuzzy control.
- b) Explain neuro fuzzy system.
- c) What is fuzzy cognitive map?
- d) Write a short note on fuzzy regression.
- e) Explain fuzzy expert system.
- 5. a) The professional photographers are asked to suggest the best camera between models of ABCD. The pairwise comparison/relation matrix is

$$R = \begin{bmatrix} 0 & 0.8 & 0.5 & 0.4 \\ 0.2 & 0 & 0.4 & 0.2 \\ 0.5 & 0.6 & 0 & 0.2 \\ 0.6 & 0.8 & 0.8 & 0 \end{bmatrix}$$
 determine average fuzziness and average certainty.

 $(1 \times 10 = 10)$ 

- b) Explain:
  - i) Fuzzy ordering
  - ii) Multiobjective decision.

 $(1 \times 10 = 10)$ 

OR

b) What is SPC? Explain in detail measurement and attribute SPC.

Seat	0-1	
No.	Set	P

## B.E. (Electronics and Telecommunication) (Part – II) (Old)

		Elective – II: [	Examina DSP PROCE	•		PLIC	CATION	
•		d Date : Thursday, 24- 3.00 p.m. to 6.00 p.m					Total Marks : 100	)
		3) Q. N in A 4) <b>Ans</b>	sume <b>suitable</b> No. <b>1</b> is <b>compu</b> Inswer Book Pa <b>swer MCQ/Ob</b> j	data <b>Isory</b> : age N <b>iectiv</b>	if necessary. It should be sol lo. <b>3. Each</b> ques <b>e type questio</b> r	stion <b>1s o</b> i	in <b>first 30 minutes</b> n carries <b>one</b> mark. n <b>Page No. 3 only.</b> <b>6) on Top of Page.</b>	
Dur	atio	M n : 30 Minutes	ICQ/Objective	Туре	Questions		Marks : 20	<b>1</b>
Duit	aliO	ii. 30 Millutes					iviains . 20	J
1.		oose the correct alter					(20×1=20	)
	1)	Only data ADSP-210	61 is		bit processor.			
		a) 8 b	) 16	c)	32	d)	64	
	2)	The AR ALU (ARALI	U) performs _		arithme	tic o	n	
		numbers. a) Unsigned, 16	) Signed, 16	c)	Signed, 32	d)	Unsigned, 32	
	3)	The TMS 320C6X ger	neration of DSF	os is b	ased on		architecture.	
		a) VelociTI b	) Velocity	c)	Velocit	d)	None	
	4)	The ARALU stands for a) Ancillary Register Acc) Anchor Register Acc	ALU		Auxiliary Regis	ster	ALU	
	5)	SRAM and integrated a) Single ported c) Single/dual ported	d input output p	periph b) d)	erals in ADSP-2 Dual ported Both a) and c)	2106	31 are	
	6)	The TMS320C6X is _	p	roces	ssor.			

a) Floating point b) Fixed point c) Floating/fixed point d) All above



8)	The No. of 32 bit ge a) 4	neral purpose reg b) 8	isters in C6X is c) 16	d) 32
9)	The register used for	,	dress of the current	data memory page is
,	<ul><li>c) They have same</li><li>d) The contents of presented in the contents.</li></ul>	rate memory bus stion the enable data memory bus stru rogram memory car	structure for data a a transfer between cture for data and nnot copy into data	and program the program and data program memory or vice versa
11)		ependent buses fo	or dual data fetch,	instruction fetch and
	nonintrusive I/O. a) 4	b) 8	c) 6	d) 16
12)	affecting the conten a) Parallel logic uni	ts of ACC.	of logical operatory of logical operators operators of logical operators operator	tion on data without
	c) Central ALU		d) None	
13)	L1P and L1D cache		c) 4	
14)	The C6X pipeline re	•	phases in fetc	•
15)	The result of operat a) ACC	ion performed in c b) ACCB		
16)	The C6X pipeline re a) 2	quires b) 24		
17)	DSP processors car a) Image processin c) Signal processin	g		
18)	In TMS320C6X inte a) Separate program c) Only program			orogram and data
19)	The data move (DM a) Either direct and b) Either direct or in c) Indirect addressi d) All above	indirect addressir ndirect addressing	ng mode	
20)	memory space.			th program and data
	a) 4	b) 8	c) 16	d) 64



Seat	
No.	

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION-I

2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Explain about fixed point DSP processors.
- 2) Compare between fixed point and floating point DSPs.
- 3) Enlist the features of TMS 320C54X.
- 4) List the functional units in CALU of 5X and explain.
- 5) What are different buses of TMS 320C54X and their functions?

3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) Draw the architecture of ADSP-21061 and explain in detail.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

SECTION-II

4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw cache configuration register (CCFG).
- 2) Explain how the C6X architecture differs from C54X.
- 3) Explain the use of HPI in C6X.
- 4) Explain the operation of L2 cache controller.
- 5) Explain FIR implementation using TMS 320C6X DSP processor.

5. Attempt any two:

- 1) Draw and explain TMS320C6X CPU data paths.
- 2) Explain internal architecture of TMS320C6X processor.
- 3) Explain the C6X pipeline operation in detail.

Seat	
No.	

Day and Date: Thursday, 24-11-2016 Total Marks: 100 Time: 3.00 p.m. to 6.00 p.m. **Instructions**: 1) **All** questions are **compulsory**. 2) Assume suitable data if necessary.

- 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 4) Answer MCQ/Objective type questions on Page No. 3 only.

		Don't forget to	o mention, Q.P. Set	t (P/Q/R/S) on Top of Page.	
Dur	ation : 30 Minutes	•	tive Type Questior	<b>ns</b> Marks : 2	0
1.	Choose the corr	ect alternative :		(20×1=20	)
	1) The C6X pipe a) 2		phases in c) 5		
	a) Image pro	ocessing	b implement b) Video pro d) All above	ocessing	
	,	•	•	rate program and data	
	a) Either dire	ve (DMOV) instructed and indirect addrect or indirect addrect	dressing mode		
	5) The L2 cach memory spa		K word is shared by	y both program and data	
	a) 4	b) 8	c) 16	d) 64	
	•		bit process		
	a) 8	b) 16	c) 32	d) 64	



7)	The AR ALU (ARA numbers.	LU) performs		arithmeti	ic o	n
	a) Unsigned, 16	b) Signed, 16	c)	Signed, 32	d)	Unsigned, 32
8)	The TMS 320C6X g	eneration of DSPs	is b	ased on		architecture.
	a) VelociTI	b) Velocity	c)	Velocit	d)	None
9)	The ARALU stands				_	
	<ul><li>a) Ancillary Register</li><li>c) Anchor Register</li></ul>		b) d)	None Regis	ter	ALU
10)	SRAM and integrate a) Single ported c) Single/dual porte				106	1 are
11)	The TMS320C6X is	s pro	ces	ssor.		
	a) Floating point		b)	Fixed point		
	c) Floating/fixed po	pint	d)	All above		
12)	The multipliers mult	iply ×	<	numbe	ers.	
	a) 16, 16				d)	32, 32
13)	The No. of 32 bit geat a) 4	eneral purpose reg b) 8			d)	32
14)	The register used for					memory page is
	a) DP	b) ARP	c)	ARB	d)	None
15)	The 320C54 DSP a a) They have sepa b) They have instruct c) They have same d) The contents of p	rate memory bus so ction the enable dat the memory bus stru	stru a tra ctu	cture for data an ansfer between three for data and p	nd p ne p orog	orogram rogram and data gram
16)	inc	dependent buses fo	or d	lual data fetch, i	nstr	uction fetch and
	nonintrusive I/O.			_		
	a) 4	b) 8	c)		,	16
17)	The		ı of	logical operation	on (	on data without
	affecting the conter a) Parallel logic un		h)	Auxiliary ALU		
	c) Central ALU		•	None		
18)	L1P and L1D cache		,		enat	h.
-,	a) 8	b) 16	c)	4		64
19)	The C6X pipeline r	equires		phases in fetch	sta	ge.
-	a) 2	b) 4	c)	5	d)	6
20)	The result of operate a) ACC	tion performed in o		ral ALU are stor TREG0		into PREG



Seat	
No.	

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Assume suitable data if necessary.

SECTION-I

2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Explain about fixed point DSP processors.
- 2) Compare between fixed point and floating point DSPs.
- 3) Enlist the features of TMS 320C54X.
- 4) List the functional units in CALU of 5X and explain.
- 5) What are different buses of TMS 320C54X and their functions?

3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) Draw the architecture of ADSP-21061 and explain in detail.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

SECTION - II

4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw cache configuration register (CCFG).
- 2) Explain how the C6X architecture differs from C54X.
- 3) Explain the use of HPI in C6X.
- 4) Explain the operation of L2 cache controller.
- 5) Explain FIR implementation using TMS 320C6X DSP processor.

5. Attempt any two:

- 1) Draw and explain TMS320C6X CPU data paths.
- 2) Explain internal architecture of TMS320C6X processor.
- 3) Explain the C6X pipeline operation in detail.

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No.	Set	R

#### B.E. (Electronics and Telecommunication) (Part – II) (Old) Examination, 2016 Elective - II: DSP PROCESSORS AND APPLICATION

Day and Date: Thursday, 24-11-2016	Total Marks: 100
Day and Date. Thursday, 27-11-2010	Total Marks . Too

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

- 2) Assume suitable data if necessary.
- 3) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3. Each question carries one mark.
- 4) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.

			MCQ/Objective	Type	Questions		
Dur	atio	n : 30 Minutes	•	•			Marks : 20
1.	Cr	noose the correct al	ternative :				(20×1=20)
	1)	nonintrusive I/O.	dependent buses	for d	ual data fetch, i	nstruction fe	tch and
		a) 4	b) 8	c)	6	d) 16	
	2)	The affecting the conte a) Parallel logic un	nts of ACC.		logical operati Auxiliary ALU	on on data	without
		c) Central ALU		,	•		
	3)	L1P and L1D cach a) 8		c)	K-word le	ength. d) 64	
	4)	The C6X pipeline a) 2		<u>c)</u>	phases in fetch	stage. d) 6	
	5)	The result of opera	•				
	6)	The C6X pipeline ra) 2					
	7)	DSP processors ca a) Image processi c) Signal processi	ng	b)	nt Video processi All above	• •	



8)		rganized as b) Not separate program and data d) Only data					
9)	The data move (DMOV) instruction can use a) Either direct and indirect addressing mode b) Either direct or indirect addressing mode c) Indirect addressing d) All above						
10)	The L2 cache of _ memory space.			•	•		
	a) 4	b) 8	c)	16	d)	64	
11)	Only data ADSP-21						
	a) 8	b) 16	c)	32	d)	64	
12)	The AR ALU (ARA numbers.	LU) performs		arithmeti	СО	n	
	a) Unsigned, 16	b) Signed, 16	c)	Signed, 32	d)	Unsigned, 32	
13)	The TMS 320C6X g a) VelociTI	eneration of DSPs b) Velocity	is b	oased on Velocit	d)	architecture. None	
14)	The ARALU stands	for					
	<ul><li>a) Ancillary Register</li><li>c) Anchor Register</li></ul>		b) d)	Auxiliary Regist None	ter .	ALU	
15)	SRAM and integrate a) Single ported c) Single/dual porte				106	1 are	
	The TMS320C6X is a) Floating point c) Floating/fixed po	pint	b) d)	Fixed point All above			
17)	The multipliers mult	iply×	ζ	numbe	ers.		
	The multipliers mult a) 16, 16	b) 17, 17	c)	24, 24	d)	32, 32	
	The No. of 32 bit geta) 4		iste		d)	32	
19)	The register used for a) DP	which holds the adb) ARP		ss of the current o		memory page is None	
20)	The 320C54 DSP aa) They have sepab) They have instructed in the contents of page 1.	rate memory bus so ction the enable data e memory bus stru	stru a tra ctu	cture for data ar ansfer between the re for data and p	nd p ne p orog	orogram rogram and data yram	



Seat	
No.	

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

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

2) Assume suitable data if necessary.

SECTION-I

2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Explain about fixed point DSP processors.
- 2) Compare between fixed point and floating point DSPs.
- 3) Enlist the features of TMS 320C54X.
- 4) List the functional units in CALU of 5X and explain.
- 5) What are different buses of TMS 320C54X and their functions?

3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) Draw the architecture of ADSP-21061 and explain in detail.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

SECTION-II

4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw cache configuration register (CCFG).
- 2) Explain how the C6X architecture differs from C54X.
- 3) Explain the use of HPI in C6X.
- 4) Explain the operation of L2 cache controller.
- 5) Explain FIR implementation using TMS 320C6X DSP processor.

5. Attempt any two:

- 1) Draw and explain TMS320C6X CPU data paths.
- 2) Explain internal architecture of TMS320C6X processor.
- 3) Explain the C6X pipeline operation in detail.

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P.T.O.

## B.E. (Electronics and Telecommunication) (Part – II) (Old) Examination, 2016 Elective – II: DSP PROCESSORS AND APPLICATION

		Elective -	- II : DSP PRO	CESSORS AND	APPLIC	CATION	
•		d Date : Thursd 3.00 p.m. to 6.	lay, 24-11-2016 00 p.m.			Total I	Marks : 100
	1		3) Q. No. <b>1</b> is <b>com</b> in Answer Book 4) <b>Answer MCQ/</b> 0	re compulsory. ble data if necessa pulsory. It should be Rege No. 3. Each Objective type que mention, Q.P. Se	pe solved question estions or	carries <b>c</b> <b>1 Page N</b>	one mark. o. 3 only.
Dura	atio	on : 30 Minutes	MCQ/Object	ive Type Questior	าร		Marks : 20
1.	Ch	noose the corre	ect alternative :				(20×1=20)
	1)	The TMS320C a) Floating po c) Floating/fix	C6X is int ed point	_ processor. b) Fixed poi d) All above	nt		· ·
	2)	The multipliers a) 16, 16	multiply b) 17, 17	×	numbers. d)	32, 32	
	3)	The No. of 32 a) 4		e registers in C6X c) 16	is d)	32	
	4)	The register use a) DP	ed for which holds the b) ARP	he address of the cu c) ARB	ırrent data d)	memory None	page is
	5)	<ul><li>a) They have</li><li>b) They have i</li><li>c) They have</li></ul>	separate memory nstruction the enabl same memory bus	ve advanced Harva bus structure for colled data transfer betwards structure for data bry cannot copy into	lata and posternation ween the posterior and programmers and programmers.	orogram rogram a gram	nd data
	6)	•	independent bus	ses for dual data fe		-	
		nonintrusive i/ a) 4	O. b) 8	c) 6	d)	16	

7) The \_\_\_\_\_ permits execution of logical operation on data without

b) Auxiliary ALU

d) None

affecting the contents of ACC.

a) Parallel logic unit

c) Central ALU



8)	L1P and L1D cache	es are each of	K-	word length	ı <b>.</b>	
	a) 8	b) 16	c) 4	d) (	64	
9)	The C6X pipeline r			in fetch stag	ge.	
	a) 2	b) 4	c) 5	d) (	6	
10)	The result of opera	-				
	•	b) ACCB	-	_		
11)	The C6X pipeline re					
	a) 2	,	•	d) (		
12)	DSP processors ca				olication.	
	a) Image processing	-				
10\	c) Signal processing		d) All abov	E		
13)	In TMS320C6X inte		~	arate nrogra	m and data	
	c) Only program	<ul><li>b) Not separate program and data</li><li>d) Only data</li></ul>				
14)	The data move (DN		,			
,	a) Either direct and					
	b) Either direct or i	indirect addressing	mode			
	c) Indirect address	sing				
	d) All above					
15)	The L2 cache of _ memory space.	K word	d is shared	by both prog	gram and data	
	• •					
40\	a) 4	b) 8	c) 16	d) (	64	
16)	/	•	c) 16 bit proce	,	64	
16)	<ul><li>a) 4</li><li>Only data ADSP-21</li><li>a) 8</li></ul>	•	bit proce	ssor.		
	Only data ADSP-21 a) 8	061 is b) 16	bit proce c) 32	ssor.	64	
	Only data ADSP-21	061 is b) 16	bit proce c) 32	ssor.	64	
	Only data ADSP-21 a) 8 The AR ALU (ARA	b) 16 LU) performs	bit proce c) 32 a	ssor. d) ( rithmetic on	64	
17)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers.	b) 16 LU) performs b) Signed, 16	bit proce c) 32 a c) Signed,	ssor. d) ( rithmetic on 32 d) (	64  Unsigned, 32	
17)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers. a) Unsigned, 16	b) 16 LU) performs b) Signed, 16 leneration of DSPs	bit proce c) 32 a c) Signed, is based on	ssor. d) ( rithmetic on 32 d) (	64  Unsigned, 32  architecture.	
17) 18)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers. a) Unsigned, 16 The TMS 320C6X g a) VelociTI The ARALU stands	b) 16 LU) performs b) Signed, 16 leneration of DSPs b) Velocity	bit proce c) 32  c) Signed, is based on c) Velocit	ssor. d) 6 rithmetic on 32 d) 6	Unsigned, 32 architecture.	
17) 18)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers. a) Unsigned, 16 The TMS 320C6X g a) VelociTI The ARALU stands a) Ancillary Register	b) 16 LU) performs b) Signed, 16 leneration of DSPs b) Velocity for er ALU	bit proce c) 32  c) Signed, is based on c) Velocit  b) Auxiliary	ssor. d) ( rithmetic on 32 d) (	Unsigned, 32 architecture.	
17) 18) 19)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers. a) Unsigned, 16 The TMS 320C6X g a) VelociTI The ARALU stands a) Ancillary Register c) Anchor Register	b) 16 LU) performs b) Signed, 16 eneration of DSPs b) Velocity for er ALU	bit proce c) 32  a c) Signed, is based on c) Velocit b) Auxiliary d) None	ssor. d) 6 rithmetic on 32 d) 6 d) 1	Mone  LU  LU  LU  LU  LU  LU  LU  LU  LU  L	
17) 18) 19)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers. a) Unsigned, 16 The TMS 320C6X g a) VelociTI The ARALU stands a) Ancillary Register C) Anchor Register SRAM and integrate	b) 16 LU) performs b) Signed, 16 eneration of DSPs b) Velocity for er ALU	bit proce c) 32  c) Signed, is based on c) Velocit  b) Auxiliary d) None ripherals in A	ssor. d) 6 rithmetic on 32 d) 6 d) 1 Register A	Mone  LU  LU  LU  LU  LU  LU  LU  LU  LU  L	
17) 18) 19)	Only data ADSP-21 a) 8 The AR ALU (ARA numbers. a) Unsigned, 16 The TMS 320C6X g a) VelociTI The ARALU stands a) Ancillary Register c) Anchor Register	b) 16 LU) performs b) Signed, 16 leneration of DSPs b) Velocity for er ALU ed input output per	bit proce c) 32  a c) Signed, is based on c) Velocit b) Auxiliary d) None	ssor. d) 6 rithmetic on 32 d) 1 d) 1 Register A ADSP-21061	Mone  LU  LU  LU  LU  LU  LU  LU  LU  LU  L	



Seat	
No.	

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) Assume suitable data if necessary.

SECTION-I

2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Explain about fixed point DSP processors.
- 2) Compare between fixed point and floating point DSPs.
- 3) Enlist the features of TMS 320C54X.
- 4) List the functional units in CALU of 5X and explain.
- 5) What are different buses of TMS 320C54X and their functions?

3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) Draw the architecture of ADSP-21061 and explain in detail.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

SECTION-II

4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw cache configuration register (CCFG).
- 2) Explain how the C6X architecture differs from C54X.
- 3) Explain the use of HPI in C6X.
- 4) Explain the operation of L2 cache controller.
- 5) Explain FIR implementation using TMS 320C6X DSP processor.

5. Attempt any two:

- 1) Draw and explain TMS320C6X CPU data paths.
- 2) Explain internal architecture of TMS320C6X processor.
- 3) Explain the C6X pipeline operation in detail.

					SLR-E	P -	474
Seat No.						Set	Р
B.E.		and Telecommur Examinative – II:WIRELE	ation,	2016		II) (N	lew)
-		day, 24-11-2016	.00 01			Marks	: 100
	Instructions :	<ol> <li>Q. No. 1 is computed in Answer Book F</li> <li>Answer MCQ/ODOn't forget to I</li> </ol>	Page No <b>bjectiv</b>	o. <b>3. Each</b> question <b>e type questio</b> n	on carries <b>or</b> n <mark>s on Page</mark>	ne marl • No. 3	k. <b>only.</b>
Durati	on : 30 Minutes	MCQ/Objectiv	е Туре	Questions		Mark	s : 20
1. Cl	hoose the corre	ect answer :				(20×	1=20)
1	)	is a basic unit with or		l sensors, proce	ssor, memo	•	,
	a) Sensor	em and power supply b) Sensor noo		Routing	d) None of	f the at	oove
2		ork is subject to a uni oard battery power d b)	b)	t of resource co Limited n/w con None of the abo	inection ban		1
3	) Advantage of a) Energy	sensor network is b) Detection	c)	Both a) and b)	d) None of	f the ab	oove
4	) In wireless ac a) Access pc c) Nodes are	int is not required	b) d)	Access point is None of the abo	required		
5	) The network i control or hie a) MANET c) Peer to Pe	•	b)	ymmetric and th Client Server To None of the abo	echnology	ntral	
6	) In single node a) Controller c) Sensors/A		b)	dware compone Communication All of the above	n device		
7	<ul><li>Design and o a) QoS suppos</li><li>Scalability</li></ul>		b)	s Energy efficien All of above	су		
8	<ul><li>a) Application</li><li>b) Presentation</li></ul>	vork, la n, Transport, Networ on, Session, Networ on, Session, Applica oove	·k, Data ·k, Data	a link and Physic a link and Physic	al		



9)	PSFQ stands for							
ŕ	<ul><li>a) Pump Slow Fet</li><li>c) Both a) and b)</li></ul>	ch Quick	<ul><li>b) Pump Start Fetch Quick</li><li>d) None of the above</li></ul>					
10)	Efficient and time synchronization pro			cols are necessa	ary t	to reduce the		
	<ul><li>a) Latency error a</li><li>c) Cross connection</li></ul>			SNR and jitter None of the abo	ove			
11)	MAC stands for							
	a) Medium Access	s Control	b)	Medium Action	Co	ntrol		
	c) Medium Access	s Character	d)	None of the abo	ove			
12)	MAC	protocol is widely ι	ıse	d in modern cellu	ılar	communication		
	systems.							
	a) TDMA	b) FDMA	c)	CDMA	d)	All of the above		
13)	is the	basic task of all M	AC	protocols.				
	a) Collision avoidance			Energy efficien				
	c) Scalability		d) None of the above					
14)	Main role of time sy	ynchronization in c	listr	ributed networks	is t	to		
	•	Ensure common time scale for all						
	b) Provide right ter	on a	mong all nodes					
	c) Both a) and b)							
	d) None of the abo	ove						
15)	BS stands for							
	a) Base station	b) Base service	c)	Best station	d)	None of the above		
16)	Clustering in WSN							
	a) System scalabi		b) Life time					
	c) Energy efficience	СУ	d) All of the above					
17)	routin	g is an efficient wa	y to	lower energy co	nsı	umption within a		
	cluster.							
	a) Hierarchical	b) Hybrid	c)	Smart	d)	None of the above		
18)	tags h	nave a transmitter a	and	their own power	so	urce.		
	a) Active RFID	b) Passive RFID	c)	Both a) and b)	d)	None of the above		
19)	RFID stands for							
·	a) Radio frequency	y identification	b)	Radio first iden	tific	ation		
	c) Both a) and b)		d)	None of the abo	ove			
20)	key el	ement is involved ir	n ph	ysical aspects of	ant	ennas in energy		
,	harvesting.		•	- •		<b>3</b> ,		
	a) Antenna gain		b)	Reflection coef	ficie	ents		
	c) Polarization		d) All of the above					



Seat No.	
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#### Elective - II: WIRELESS SENSOR NETWORKS

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

#### 2. Solve any four:

20

- a) What are the various challenges in Wireless Sensor Networks?
- b) Write a note on Energy Consumption of Sensor Nodes.
- c) Explain the concept of gateway.
- d) Write a note on time synchronization.
- e) Explain how to control the topology.

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

20

- a) Explain optimization goals and figures of merit of network architecture.
- b) Explain the concept of sensor tasking and control.
- c) Explain the various enabling technologies for wireless sensor networks. Mention the various applications of WSN.

#### 4. Solve any four:

20

- a) Explain the concept of low duty cycle in MAC protocol.
- b) Write a note on Backscatter communication.
- c) Explain the use of RFID in healthcare.
- d) What are the various aspects of EMC?
- e) Explain any one connection based protocol.

### 5 Solve **any two** of the following:

20

- a) Explain IEEE 802.15.4 MAC protocol.
- b) Explain RFID Physical Layer Design Automation.
- c) Explain the application of RFID in identification and data capture.


						S	SLR-EP –	474
Seat No.							Set	Q
B.E.			Examination	on,	on Engineerin 2016 ENSOR NETW	•	, , ,	lew)
-	nd Date : Thurso 3.00 p.m. to 6.	-	1-2016				Max. Marks	: 100
	Instructions:	in Ans	swerBook Page <b>ver MCQ/Obje</b>	e No ctiv	It should be solve o. 3. Each question or type question on, Q.P. Set (P/C	on c <b>ns</b> (	arries <b>one</b> mar <b>on Page No. 3</b>	k. only.
Duration	on : 30 Minutes		Q/Objective T	уре	Questions		Mark	s : 20
1. Cl	noose the corre	ct answe	er:				(20×	1=20)
1)	<ul><li>Clustering in V</li><li>a) System so</li><li>c) Energy eff</li></ul>	alability	tribute to	•	Life time All of the above	<b>,</b>		
2)	cluster.	_			lower energy co		•	
3)		tags have	e a transmitter a	and	Smart their own power Both a) and b)	so	urce.	
4)	) RFID stands t	for uency ide	entification	b)	Radio first ident	tific		3010
5)	harvesting.  a) Antenna ga	ain	ent is involved ir	b)	ysical aspects of Reflection coeff All of the above	ficie	_	Ι <b>y</b>
6)	,	is a basic em and p	unit with on bo ower supply. Sensor node	arc	l sensors, proce	SSO	or, memory, None of the a	bove
7	,	•		,	et of resource co	,		

b) Limited n/w connection bandwidth

8) Advantage of sensor network is

c) Both a) and b)

a) Finite on board battery power

c) Both a) and b) d) None of the above a) Energy b) Detection



9)	In wireless adhoc network  a) Access point is not required  c) Nodes are not required	<ul><li>b) Access point is required</li><li>d) None of the above</li></ul>					
10)	) The network in which all the nodes are symmetric and there is no central						
	control or hierarchy is a) MANET c) Peer to Peer	<ul><li>b) Client Server Technology</li><li>d) None of the above</li></ul>					
11)	<ul> <li>In single node architecture, following hardware component is used</li> <li>a) Controller and memory</li> <li>b) Communication device</li> <li>c) Sensors/Actuators</li> <li>d) All of the above</li> </ul>						
12)	Design and optimization goal for WSNs is  a) QoS support  b) Energy efficiency c) Scalability  d) All of above						
13)	In sensor network, layers a) Application, Transport, Network, E b) Presentation, Session, Network, E c) Presentation, Session, Application d) None of above	Pata link and Physical Pata link and Physical					
14)	PSFQ stands for						
	<ul><li>a) Pump Slow Fetch Quick</li><li>c) Both a) and b)</li></ul>	<ul><li>b) Pump Start Fetch Quick</li><li>d) None of the above</li></ul>					
15)	Efficient and time synchronization pro	,					
	a) Latency error and jitters	b) SNR and iitter					
	c) Cross connection and jitter	d) None of the above					
16)	MAC stands for						
	<ul><li>a) Medium Access Control</li><li>c) Medium Access Character</li></ul>	<ul><li>b) Medium Action Control</li><li>d) None of the above</li></ul>					
17)	MAC protocol is widely u	sed in modern cellular communication					
	systems. a) TDMA b) FDMA	c) CDMA d) All of the above					
18)	is the basic task of all M	•					
	<ul><li>a) Collision avoidance</li><li>c) Scalability</li></ul>	<ul><li>b) Energy efficiency</li><li>d) None of the above</li></ul>					
ŕ	Main role of time synchronization in d a) Ensure common time scale for all b) Provide right temporal co-ordination c) Both a) and b) d) None of the above	network nodes					
20)	BS stands for a) Base station b) Base service	c) Best station d) None of the above					



Seat No.	

#### Elective - II: WIRELESS SENSOR NETWORKS

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

#### 2. Solve any four:

20

- a) What are the various challenges in Wireless Sensor Networks?
- b) Write a note on Energy Consumption of Sensor Nodes.
- c) Explain the concept of gateway.
- d) Write a note on time synchronization.
- e) Explain how to control the topology.

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

20

- a) Explain optimization goals and figures of merit of network architecture.
- b) Explain the concept of sensor tasking and control.
- c) Explain the various enabling technologies for wireless sensor networks. Mention the various applications of WSN.

#### 4. Solve any four:

20

- a) Explain the concept of low duty cycle in MAC protocol.
- b) Write a note on Backscatter communication.
- c) Explain the use of RFID in healthcare.
- d) What are the various aspects of EMC?
- e) Explain any one connection based protocol.

#### 5 Solve **any two** of the following:

20

- a) Explain IEEE 802.15.4 MAC protocol.
- b) Explain RFID Physical Layer Design Automation.
- c) Explain the application of RFID in identification and data capture.

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Seat No.								Set	R	
B.E.			Examination	on,	on Engineerin 2016 ENSOR NETW			II) (N	lew)	
-	nd Date : Thurso 3.00 p.m. to 6.	-	1-2016				Max. I	Marks	: 100	)
	Instructions:	in Ans	swerBook Page <b>ver MCQ/Obje</b>	e No ctiv	It should be solve o. 3. Each question oe type question on, Q.P. Set (P/C	on c <b>ns</b> (	earries <b>on</b> on Page	n <b>e</b> man No. 3	k. only	
		МС	Q/Objective T	урє	Questions					
Duration	on : 30 Minutes		•					Mark	s:20	)
1. Cł	noose the corre	ect answe	er:					(20×	1=20	)
1)		ccess Co			Medium Action None of the abo		ntrol			
2)		MAC pro	tocol is widely ι	ıse	d in modern cellu	ılar	commun	nicatio	n	
0)	systems. a) TDMA	,		•	CDMA	d)	All of the	e abov	e'e	
3)	a) Collision a c) Scalability	voidance	sic task of all M	b)	Energy efficient None of the abo	-				
4)	a) Ensure co	mmon tir ght tempo d b)	ne scale for all	net	ibuted networks work nodes mong all nodes	is is i	to			
5)	) BS stands for a) Base static		Base service	c)	Best station	d)	None of	the al	bove	
6)	<ul><li>Clustering in V</li><li>a) System so</li><li>c) Energy eff</li></ul>	alability	ntribute to	,	Life time All of the above	<u>.</u>				
7)		routing is	an efficient wa	y to	lower energy co	กรเ	umption	within	a	
	cluster. a) Hierarchic	al b)	Hybrid	c)	Smart	d)	None of	the al	bove	

	-,	-,	
15)	The network in which all the nodes are control or hierarchy is a) MANET c) Peer to Peer	e symmetric and there is no central b) Client Server Technology d) None of the above	
16)	In single node architecture, following h	•	
17)	Design and optimization goal for WSN a) QoS support c) Scalability	ls is b) Energy efficiency d) All of above	
18)	In sensor network, layers a) Application, Transport, Network, Db) Presentation, Session, Network, Dc) Presentation, Session, Application d) None of above	Pata link and Physical Pata link and Physical	
19)	PSFQ stands for a) Pump Slow Fetch Quick c) Both a) and b)	<ul><li>b) Pump Start Fetch Quick</li><li>d) None of the above</li></ul>	
20)	Efficient and time synchronization pro	tocols are necessary to reduce the	
	<ul><li>a) Latency error and jitters</li><li>c) Cross connection and jitter</li></ul>	<ul><li>b) SNR and jitter</li><li>d) None of the above</li></ul>	
	<del></del>	<del></del>	S



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#### Elective - II: WIRELESS SENSOR NETWORKS

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

#### 2. Solve any four:

20

- a) What are the various challenges in Wireless Sensor Networks?
- b) Write a note on Energy Consumption of Sensor Nodes.
- c) Explain the concept of gateway.
- d) Write a note on time synchronization.
- e) Explain how to control the topology.

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20

- a) Explain optimization goals and figures of merit of network architecture.
- b) Explain the concept of sensor tasking and control.
- c) Explain the various enabling technologies for wireless sensor networks. Mention the various applications of WSN.

#### 4. Solve any four:

20

- a) Explain the concept of low duty cycle in MAC protocol.
- b) Write a note on Backscatter communication.
- c) Explain the use of RFID in healthcare.
- d) What are the various aspects of EMC?
- e) Explain any one connection based protocol.

#### 5 Solve **any two** of the following:

20

- a) Explain IEEE 802.15.4 MAC protocol.
- b) Explain RFID Physical Layer Design Automation.
- c) Explain the application of RFID in identification and data capture.

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Seat No.						S	Set	S
B.E. (	•	and Telecommui Examin ve – II:WIRELE	ation,	2016	•	`	I) (N	lew)
-	d Date : Thurso 3.00 p.m. to 6.	day, 24-11-2016 00 p.m.				Max. Max. Max. Max.	arks	: 100
	Instructions :	<ol> <li>Q. No. 1 is complian Answer Book F</li> <li>Answer MCQ/O</li> <li>Don't forget to I</li> </ol>	Page No <b>bjectiv</b>	o. 3. <b>Each</b> qui <b>e type que</b> s	estion c <b>stions</b> (	arries <mark>one</mark> on Page N	mar I <b>o. 3</b>	k. <b>only.</b>
		MCQ/Objectiv	e Type	Questions				
Duratio	on : 30 Minutes	•	7.			N	/lark	s:20
1. Ch	oose the corre	ct answer :				(	20×	1=20)
1)		architecture, followi and memory ctuators	b)	dware comp Communic All of the al	ation de			·
2)	Design and op a) QoS suppo c) Scalability		b)	s Energy effi All of above	ciency			
3)	<ul><li>a) Application</li><li>b) Presentati</li></ul>	n, Transport, Networ on, Session, Networ on, Session, Applica	rk, Data rk, Data	ı link and Ph	iysical	al		
4)	PSFQ stands a) Pump Slov c) Both a) an	v Fetch Quick	,	Pump Start		Quick		
5)		ime synchronization	protoc	ols are nec	essary t	o reduce t	he	
	a) Latency er	ror and jitters nection and jitter	,	SNR and jit None of the				
6)	MAC stands f a) Medium A c) Medium A		•	Medium Ac None of the		ntrol		
7)	!	MAC protocol is wide	ely used	d in modern	cellular	communic	atio	n
	systems. a) TDMA	b) FDMA	c)	CDMA	d)	All of the a	abov	e'e

8)	is the basic task of all M		•		
	<ul><li>a) Collision avoidance</li><li>c) Scalability</li></ul>		Energy efficience None of the abo	-	
9)	<ul> <li>Main role of time synchronization in d</li> <li>a) Ensure common time scale for all</li> <li>b) Provide right temporal co-ordination</li> <li>c) Both a) and b)</li> <li>d) None of the above</li> </ul>	net	work nodes	is t	to
10)	BS stands for a) Base station b) Base service	c)	Best station	d)	None of the above
11)	Clustering in WSN contribute to a) System scalability c) Energy efficiency	,	Life time All of the above		
12)	routing is an efficient way	y to	lower energy co	ทรเ	umption within a
	cluster.	٥)	Smort	۹/	None of the above
12\	<ul><li>a) Hierarchical</li><li>b) Hybrid</li><li>tags have a transmitter a</li></ul>	•		,	
13)	a) Active RFID b) Passive RFID		•		
14)	RFID stands for a) Radio frequency identification c) Both a) and b)		Radio first ident		ation
15)	key element is involved in	ph	ysical aspects of	ant	ennas in energy
	harvesting. a) Antenna gain c) Polarization	•	Reflection coeff All of the above		ents
16)	is a basic unit with on bo	arc	l sensors, proces	sso	r, memory,
	wireless modem and power supply. a) Sensor b) Sensor node	,	•	,	None of the above
17)	Sensor network is subject to a unique a) Finite on board battery power c) Both a) and b)	b)	et of resource co Limited n/w con None of the abo	nec	
18)	Advantage of sensor network is a) Energy b) Detection	c)	Both a) and b)	d)	None of the above
19)	In wireless adhoc network a) Access point is not required c) Nodes are not required	,	Access point is None of the abo		quired
20)	The network in which all the nodes are	e s	ymmetric and th	ere	is no central
	control or hierarchy is a) MANET c) Peer to Peer		Client Server Te None of the abo		nology



Seat No.
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#### Elective - II: WIRELESS SENSOR NETWORKS

Day and Date: Thursday, 24-11-2016 Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

#### 2. Solve any four:

20

- a) What are the various challenges in Wireless Sensor Networks?
- b) Write a note on Energy Consumption of Sensor Nodes.
- c) Explain the concept of gateway.
- d) Write a note on time synchronization.
- e) Explain how to control the topology.

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

20

- a) Explain optimization goals and figures of merit of network architecture.
- b) Explain the concept of sensor tasking and control.
- c) Explain the various enabling technologies for wireless sensor networks. Mention the various applications of WSN.

#### 4. Solve any four:

20

- a) Explain the concept of low duty cycle in MAC protocol.
- b) Write a note on Backscatter communication.
- c) Explain the use of RFID in healthcare.
- d) What are the various aspects of EMC?
- e) Explain any one connection based protocol.

#### 5 Solve any two of the following:

20

- a) Explain IEEE 802.15.4 MAC protocol.
- b) Explain RFID Physical Layer Design Automation.
- c) Explain the application of RFID in identification and data capture.

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Seat	
No.	

Set

#### **B.E.** (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective - II)

Day and Date: Thursday, 24-11-2016 Time: 3.00 p.m. to 6.00 p.m.	Total Marks : 100
in Answer I 2) <b>Answer M</b>	Compulsory. It should be solved in first 30 minutes Book Page No. 3. Each question carries one mark. CQ/Objective type questions on Page No. 3 only. et to mention, Q.P. Set (P/Q/R/S) on Top of Page.
MCQ/O	ojective Type Questions
Duration: 30 Minutes	Marks: 20
1. Choose the correct answer:	(20×1=20)
<ol> <li>Gaussian density is also known a) Estimation density</li> <li>Normal density</li> <li>Which of the following are freman Bayesian, HMM</li> <li>Newton descent</li> </ol>	<ul><li>b) Parameter density</li><li>d) All of the above</li></ul>
3) In decision theory an expecte	d loss is called a risk and $(\alpha_{i } x)$ is called the
<ul><li>a) Conditional risk</li><li>c) Marginal risk</li></ul>	b) Joint risk d) None of the above
<ol> <li>Squared Mahalanobis distant</li> </ol>	e from x to μ is given by
a) $r^2 = (x - \mu)^t \sum -1(x - \mu)$	b) $r^2 = (x + \mu)^t \sum -1(x - \mu)$

- 5) Suppose we have an HMM, complete with transition probabilities  $a_{ij}$  and  $b_{jk}$ , determine the probability that a particular sequence of visible states V<sub>T</sub> was generated by that model is known as
  - a) The decoding problem

c)  $r^2 = (x + \mu)^t \sum -1(x + \mu)$ 

- b) The learning problem
- c) The evaluation problem
- d) None of the above

d) None of the above

- 6) HMM have found greatest use in
  - a) Character recognition
- b) Speech recognition

c) Gesture recognition

- d) Both b) and c)
- 7) Classifier that places a pattern in one of only two categories is called a) Dichotomizer b) Trichomizer
  - c) Economizer
- d) Chotomizer
- 8) A classifier that uses linear discriminant functions is called
  - a) Minimum-error-rate classifier
- b) Linear machine
- c) Hidden Markov model
- d) All of the above



9)	The valve of discriminant function g(x) < (a) Sample belongs to w1 c) Sample on boundary	b)	n two-category classifier indicates that Sample belong to w2 Either a) or b)
10)	If a and b are vectors, the symmetry propal D $(a, b) \ge 0$ c) D $(a, b) = D(b, a)$	b)	y is given as D (a, b) = 0 All of the above
11)	Parzen window method is used for a) Estimating error rate c) Estimating density	,	Estimating nearest neighbour All of the above
12)	If the sequence has the property that whe at level K, they remain together at all hig a) Hierarchical clustered c) Tree-clustered	gher b)	· · · · · · · · · · · · · · · · · · ·
13)	A procedure in which means tend to more criterion function is called a) K-means clustering c) Hierarchical clustering	b)	so as to minimize a squared-error  Bayes learning  None of these
14)	If the distance between two samples is si a) Same cluster c) Either a) or b)	b)	ficantly large, then they correspond to Different cluster None of these
15)	The representation of hierarchical cluster a) Graph b) Binary tree	•	g in a tree form is called Dendrogram d) None of these
16)	An act of taking in raw data and taking t pattern is known as a) Image Processing c) Signal Processing	b)	action based on the 'Category' of the  Pattern Recognition  None of the above
17)	For the 'Salmon' and 'Sea bass' fish exa a) Poor c) Not practicable	b)	ole length alone is a factor. Strong None of the above
18)	In K-means clustering, K refers to a) The no. of sample points c) Samples in the cluster	,	The no. of clusters None of these
19)	If X and Y are discrete Random Variable a) $f(x, y) = f1(x)$ c) $f(x, y) = f1(x) f2(y)$	b)	and they are Independent then $f(x, y) = f2(x)$ None of the above
20)	The shape of the cluster is determined ba) Mean vector c) Both a) and b)	b)	Covariance matrix None of the above



Seat	
No.	

### B.E. (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

SECTION - I

2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define a) Feature space
- b) Risk.
- d) Explain accuracy and computational complexity of classifier.
- e) Describe multivariate density.

3. Attempt any two:

 $(2 \times 8 = 16)$ 

a) The joint probability function of two random variables X and Y is given by

$$f(x,y) = c(x^2 + 2y),$$
  $x = 0,1,2, y = 1,2,3,4$   
= 0 otherwise

Find: a) the value of c,

- b) P(X = 2, Y = 3),
- c) P ( $X \le 1$ , Y>2), and
- d) marginal probability function of X and Y.
- b) Explain minimum error rate classification and minimax criteria.
- c) Explain Hidden Markov Models (HMM) and give HMM forward algorithm.

SECTION - II

4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Write a note on hierarchical clustering.
- b) Explain Partitional clustering.
- c) Explain statistical pattern recognition briefly.
- d) Explain genetic algorithm in brief.
- e) Explain K-nearest neighbour rule.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) How linear classifiers are trained using relaxation procedure?
- b) Explain Syntactic pattern recognition in brief.
- c) Explain scatter criteria for clustering.

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### **SLR-EP - 475**

Seat No.			Set	Q
	B.E	E. (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective – II)		

Day

Day and Date: Thursday, 24-11-2016	Total Marks: 100
Time: 3.00 p.m. to 6.00 p.m.	
in Answer Bo 2) <b>Answer MC</b> O	mpulsory. It should be solved in first 30 minutes ook Page No. 3. Each question carries one mark. Q/Objective type questions on Page No. 3 only. to mention, Q.P. Set (P/Q/R/S) on Top of Page.
-	ective Type Questions
Duration: 30 Minutes	Marks: 20
1. Choose the correct answer:	(20×1=20)
<ol> <li>The valve of discriminant function</li> <li>Sample belongs to w1</li> <li>Sample on boundary</li> </ol>	on g(x) < 0, in two-category classifier indicates that b) Sample belong to w2 d) Either a) or b)
<ul> <li>2) If a and b are vectors, the symma</li> <li>a) D (a, b) ≥ 0</li> <li>c) D (a, b) = D (b, a)</li> </ul>	netry property is given as b) D (a, b) = 0 d) All of the above
<ul> <li>Suppose we have an HMM, cor determine the probability that a generated by that model is known.</li> <li>a) The decoding problem</li> <li>c) The evaluation problem</li> </ul>	mplete with transition probabilities a <sub>ij</sub> and b <sub>jk</sub> , particular sequence of visible states V <sub>T</sub> was wn as b) The learning problem d) None of the above
<ul><li>4) HMM have found greatest use in a) Character recognition</li><li>c) Gesture recognition</li></ul>	n b) Speech recognition d) Both b) and c)
5) In decision theory an expected	loss is called a risk and $(\alpha_{ij} x)$ is called the
<ul><li>a) Conditional risk</li><li>c) Marginal risk</li></ul>	<ul><li>b) Joint risk</li><li>d) None of the above</li></ul>
6) Squared Mahalanobis distance a) $r^2 = (x - \mu)^t \sum -1(x - \mu)$	from x to $\mu$ is given by b) $r^2 = (x + \mu)^t \sum -1(x - \mu)$

c)  $r^2 = (x + \mu)^t \sum_{t=0}^{t} -1(x + \mu)^t$ 

d) None of the above

7) Gaussian density is also known as

a) Estimation density

b) Parameter density

c) Normal density

d) All of the above

8) Which of the following are frequently nearly identical?

a) Bayesian, HMM

b) HMM, Maximum Likelihood

c) Newton descent

d) Bayesian, Maximum Likelihood



9)	Classifier that places a pattern in one of a) Dichotomizer b) Trichomizer	
10)	A classifier that uses linear discriminant a) Minimum-error-rate classifier c) Hidden Markov model	
11)	If X and Y are discrete Random Variable a) $f(x, y) = f1(x)$ c) $f(x, y) = f1(x) f2(y)$	es and they are Independent then b) $f(x, y) = f2(x)$ d) None of the above
12)	The shape of the cluster is determined by a) Mean vector c) Both a) and b)	by b) Covariance matrix d) None of the above
13)	The representation of hierarchical cluster a) Graph b) Binary tree	ering in a tree form is called c) Dendrogram d) None of these
14)	An act of taking in raw data and taking t pattern is known as a) Image Processing c) Signal Processing	he action based on the 'Category' of the b) Pattern Recognition d) None of the above
15)	A procedure in which means tend to more criterion function is called a) K-means clustering c) Hierarchical clustering	ve so as to minimize a squared-error b) Bayes learning d) None of these
16)	If the distance between two samples is si a) Same cluster c) Either a) or b)	gnificantly large, then they correspond to b) Different cluster d) None of these
17)	Parzen window method is used for a) Estimating error rate c) Estimating density	<ul><li>b) Estimating nearest neighbour</li><li>d) All of the above</li></ul>
18)	If the sequence has the property that whe at level K, they remain together at all hig a) Hierarchical clustered c) Tree-clustered	•
19)	For the 'Salmon' and 'Sea bass' fish exa a) Poor c) Not practicable	ample length alone is a factor. b) Strong d) None of the above
20)	In K-means clustering, K refers to a) The no. of sample points c) Samples in the cluster	<ul><li>b) The no. of clusters</li><li>d) None of these</li></ul>



Seat	
No.	

## B.E. (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

SECTION - I

2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define a) Feature space
- b) Risk.
- d) Explain accuracy and computational complexity of classifier.
- e) Describe multivariate density.

3. Attempt any two:

 $(2 \times 8 = 16)$ 

a) The joint probability function of two random variables X and Y is given by

$$f(x,y) = c(x^2 + 2y),$$
  $x = 0,1,2, y = 1,2,3,4$   
= 0 otherwise

Find: a) the value of c,

- b) P(X = 2, Y = 3),
- c) P ( $X \le 1$ , Y>2), and
- d) marginal probability function of X and Y.
- b) Explain minimum error rate classification and minimax criteria.
- c) Explain Hidden Markov Models (HMM) and give HMM forward algorithm.

SECTION - II

4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Write a note on hierarchical clustering.
- b) Explain Partitional clustering.
- c) Explain statistical pattern recognition briefly.
- d) Explain genetic algorithm in brief.
- e) Explain K-nearest neighbour rule.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

Set Q

- a) How linear classifiers are trained using relaxation procedure?
- b) Explain Syntactic pattern recognition in brief.
- c) Explain scatter criteria for clustering.

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Seat No.	Set	R

	(New) Examination, 2016 NITION (Elective – II)
Day and Date : Thursday, 24-11-2016 Time : 3.00 p.m. to 6.00 p.m.	Total Marks: 100
in Answer Book Pag 2) <b>Answer MCQ/Obje</b>	sory. It should be solved in first 30 minutes ge No. 3. Each question carries one mark. ective type questions on Page No. 3 only. ntion, Q.P. Set (P/Q/R/S) on Top of Page.
MCQ/Objective	Type Questions
Duration: 30 Minutes	Marks: 20
1. Choose the correct answer:	(20×1=20)
<ol> <li>Classifier that places a pattern in one</li> <li>a) Dichotomizer</li> <li>b) Trichomizer</li> </ol>	of only two categories is called c) Economizer d) Chotomizer
<ul><li>2) A classifier that uses linear discrimina</li><li>a) Minimum-error-rate classifier</li><li>c) Hidden Markov model</li></ul>	Int functions is called b) Linear machine d) All of the above
<ul><li>3) Gaussian density is also known as</li><li>a) Estimation density</li><li>c) Normal density</li></ul>	<ul><li>b) Parameter density</li><li>d) All of the above</li></ul>
<ul><li>4) Which of the following are frequently r</li><li>a) Bayesian, HMM</li><li>c) Newton descent</li></ul>	nearly identical ? b) HMM, Maximum Likelihood d) Bayesian, Maximum Likelihood
<ul><li>5) The valve of discriminant function g(x)</li><li>a) Sample belongs to w1</li><li>c) Sample on boundary</li></ul>	< 0, in two-category classifier indicates that b) Sample belong to w2 d) Either a) or b)
<ul> <li>6) If a and b are vectors, the symmetry print a) D (a, b) ≥ 0</li> <li>c) D (a, b) = D (b, a)</li> </ul>	roperty is given as b) D (a, b) = 0 d) All of the above
<ol> <li>Suppose we have an HMM, complete determine the probability that a particular generated by that model is known as</li> </ol>	with transition probabilities $a_{ij}$ and $b_{jk}$ , ular sequence of visible states $V_{T}$ was
<ul><li>a) The decoding problem</li><li>c) The evaluation problem</li></ul>	<ul><li>b) The learning problem</li><li>d) None of the above</li></ul>

b) Speech recognitiond) Both b) and c)

8) HMM have found greatest use ina) Character recognitionc) Gesture recognition



9)	In decision theory an expected loss is ca	alle	d a risk and $(\alpha_{i } x)$ is called the
	<ul><li>a) Conditional risk</li><li>c) Marginal risk</li></ul>	,	Joint risk None of the above
10)	Squared Mahalanobis distance from x to	μ	is given by
	a) $r^2 = (x - \mu)^t \sum -1(x - \mu)$	b)	$r^2 = (x+\mu)^t \sum -1(x-\mu)$
	c) $r^2 = (x + \mu)^t \sum -1(x + \mu)$	d)	None of the above
11)	For the 'Salmon' and 'Sea bass' fish exa a) Poor	b)	Strong
40\	c) Not practicable	u)	None of the above
12)	In K-means clustering, K refers to a) The no. of sample points c) Samples in the cluster	,	The no. of clusters None of these
13)	Parzen window method is used for		
	<ul><li>a) Estimating error rate</li><li>c) Estimating density</li></ul>	,	Estimating nearest neighbour All of the above
14)	If the sequence has the property that whe at level K, they remain together at all hig a) Hierarchical clustered c) Tree-clustered	he b)	•
15)	If X and Y are discrete Random Variable a) $f(x, y) = f1(x)$ c) $f(x, y) = f1(x) f2(y)$	b)	and they are Independent then f(x, y) = f2(x) None of the above
16)	The shape of the cluster is determined by	ý	
,	<ul><li>a) Mean vector</li><li>c) Both a) and b)</li></ul>	b)	Covariance matrix None of the above
17)	The representation of hierarchical cluster a) Graph b) Binary tree		g in a tree form is called  Dendrogram d) None of these
18)	An act of taking in raw data and taking t pattern is known as	he	action based on the 'Category' of the
	<ul><li>a) Image Processing</li><li>c) Signal Processing</li></ul>	,	Pattern Recognition None of the above
19)	A procedure in which means tend to moveriterion function is called	ve s	so as to minimize a squared-error
	<ul><li>a) K-means clustering</li><li>c) Hierarchical clustering</li></ul>	,	Bayes learning None of these
20)	If the distance between two samples is si	gni	ficantly large, then they correspond to
	<ul><li>a) Same cluster</li><li>c) Either a) or b)</li></ul>	,	Different cluster None of these



Seat	
No.	

## B.E. (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

SECTION - I

2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define a) Feature space
- b) Risk.
- d) Explain accuracy and computational complexity of classifier.
- e) Describe multivariate density.

3. Attempt any two:

 $(2 \times 8 = 16)$ 

a) The joint probability function of two random variables X and Y is given by

$$f(x,y) = c(x^2 + 2y),$$
  $x = 0,1,2, y = 1,2,3,4$   
= 0 otherwise

Find: a) the value of c,

- b) P(X = 2, Y = 3),
- c) P ( $X \le 1$ , Y>2), and
- d) marginal probability function of X and Y.
- b) Explain minimum error rate classification and minimax criteria.
- c) Explain Hidden Markov Models (HMM) and give HMM forward algorithm.

SECTION - II

4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Write a note on hierarchical clustering.
- b) Explain Partitional clustering.
- c) Explain statistical pattern recognition briefly.
- d) Explain genetic algorithm in brief.
- e) Explain K-nearest neighbour rule.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) How linear classifiers are trained using relaxation procedure?
- b) Explain Syntactic pattern recognition in brief.
- c) Explain scatter criteria for clustering.

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Set R



Seat	
No.	

Set S

## B.E. (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016 Total Marks: 100

Time: 3.00 p.m. to 6.00 p.m.

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

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

**MCQ/Objective Type Questions** 

Duration: 30 Minutes	Marks: 20
1. Choose the correct answer:	(20×1=20)

- 1) Suppose we have an HMM, complete with transition probabilities  $a_{ij}$  and  $b_{jk}$ , determine the probability that a particular sequence of visible states  $V_T$  was generated by that model is known as
  - a) The decoding problem
- b) The learning problem
- c) The evaluation problem
- d) None of the above
- 2) HMM have found greatest use in
  - a) Character recognition
- b) Speech recognition

c) Gesture recognition

- d) Both b) and c)
- 3) The valve of discriminant function g(x) < 0, in two-category classifier indicates that
  - a) Sample belongs to w1
- b) Sample belong to w2
- c) Sample on boundary
- d) Either a) or b)
- 4) If a and b are vectors, the symmetry property is given as
  - a) D (a, b)  $\geq 0$

b) D(a, b) = 0

c) D(a, b) = D(b, a)

- d) All of the above
- 5) Classifier that places a pattern in one of only two categories is called
  - a) Dichotomizer
- b) Trichomizer
- c) Economizer
- d) Chotomizer
- 6) A classifier that uses linear discriminant functions is called
  - a) Minimum-error-rate classifier
- b) Linear machine
- c) Hidden Markov model
- d) All of the above
- 7) In decision theory an expected loss is called a risk and  $(\alpha_{_{i\mid}}\,x)$  is called the
  - a) Conditional risk

b) Joint risk

c) Marginal risk

- d) None of the above
- 8) Squared Mahalanobis distance from x to  $\mu$  is given by
  - a)  $r^2 = (x \mu)^t \sum -1(x \mu)$
- b)  $r^2 = (x + \mu)^t \sum -1(x \mu)$
- c)  $r^2 = (x + \mu)^t \sum -1(x + \mu)$
- d) None of the above



9)	Gaussian density is also known as <ul><li>a) Estimation density</li><li>c) Normal density</li></ul>	,	Parameter density All of the above
10)	Which of the following are frequently nea a) Bayesian, HMM c) Newton descent	b)	ridentical ? HMM, Maximum Likelihood Bayesian, Maximum Likelihood
11)	The representation of hierarchical cluster a) Graph b) Binary tree		-
12)	An act of taking in raw data and taking t pattern is known as		
	<ul><li>a) Image Processing</li><li>c) Signal Processing</li></ul>	,	Pattern Recognition None of the above
13)	If X and Y are discrete Random Variable	s a	nd they are Independent then
	a) $f(x, y) = f1(x)$	,	f(x, y) = f2(x)
	c) $f(x, y) = f1(x) f2(y)$	•	None of the above
14)	The shape of the cluster is determined b	•	Covariance metalis
	<ul><li>a) Mean vector</li><li>c) Both a) and b)</li></ul>	,	Covariance matrix None of the above
15)	For the 'Salmon' and 'Sea bass' fish exa	,	
10)	a) Poor		Strong
	c) Not practicable	,	None of the above
16)	In K-means clustering, K refers to		
	,	,	The no. of clusters
	c) Samples in the cluster	d)	None of these
17)	A procedure in which means tend to moveriterion function is called	ve s	so as to minimize a squared-error
	a) K-means clustering	,	Bayes learning
	c) Hierarchical clustering	d)	None of these
18)	If the distance between two samples is si		
	a) Same cluster		Different cluster
40\	c) Either a) or b)	u)	None of these
19)	Parzen window method is used for a) Estimating error rate	h۱	Estimating nearest neighbour
	c) Estimating density	,	All of the above
20)	If the sequence has the property that whe	,	
,	at level K, they remain together at all hig		· · · · · · · · · · · · · · · · · · ·
	a) Hierarchical clustered	,	On-line clustered
	c) Tree-clustered	d)	All of the above



Seat	
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## B.E. (E & TC) (Part – II) (New) Examination, 2016 PATTERN RECOGNITION (Elective – II)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

SECTION - I

2. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Mention and explain sources of classification error.
- b) Obtain an expression for linear discriminant function for two category case.
- c) Define a) Feature space
- b) Risk.
- d) Explain accuracy and computational complexity of classifier.
- e) Describe multivariate density.

3. Attempt any two:

 $(2 \times 8 = 16)$ 

a) The joint probability function of two random variables X and Y is given by

$$f(x,y) = c(x^2 + 2y),$$
  $x = 0,1,2, y = 1,2,3,4$   
= 0 otherwise

Find: a) the value of c,

- b) P(X = 2, Y = 3),
- c) P ( $X \le 1$ , Y>2), and
- d) marginal probability function of X and Y.
- b) Explain minimum error rate classification and minimax criteria.
- c) Explain Hidden Markov Models (HMM) and give HMM forward algorithm.

SECTION - II

4. Attempt any four:

 $(4 \times 6 = 24)$ 

- a) Write a note on hierarchical clustering.
- b) Explain Partitional clustering.
- c) Explain statistical pattern recognition briefly.
- d) Explain genetic algorithm in brief.
- e) Explain K-nearest neighbour rule.

5. Attempt any two:

 $(2 \times 8 = 16)$ 

- a) How linear classifiers are trained using relaxation procedure?
- b) Explain Syntactic pattern recognition in brief.
- c) Explain scatter criteria for clustering.

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memory space.

b) 8

a) 4

### SLR-EP – 476

				SLR-EP -	4/0
Seat No.				Set	Р
B.E.	= =	and Telecommun			2016
-	nd Date : Thurso 3.00 p.m. to 6	day, 24-11-2016 .00 p.m.		Total Mark	s : 100
	Instructions :	4) Answer MCQ/Obj	data if necessary. I <b>sory</b> . It should be age No. <b>3. Each</b> q <b>ective type quest</b>	uestion carries <b>one</b>	mark. <b>only.</b>
D	00 M' - 1	_	Type Questions	NA - d	l - 00
	on : 30 Minutes				ks : 20
	noose the corre			(20)	×1=20)
1)		C6X is	-		
	<ul><li>a) Floating po</li><li>c) Floating/fix</li></ul>		<ul><li>b) Fixed point</li><li>d) All above</li></ul>		
2)	,	•	,	numboro	
(2		ARAU) performs 16 b) Singed, 16			)
3)	, -	line requires	, -	, -	
0)	a) 2	b) 4	c) 5	d) 6	
4)	-	SP-21061 is	bit processo	•	
,	a) 8	b) 16	c) 32	d) 64	
5)	ADSP-21061	is			
	a) Harvard a		•	larvard architecture	
	c) Super Har	vard architecture	d) Both b) and	c)	
,	filter coefficie a) Fixed poin b) Fixed poin c) Fixed poin d) None	d point DSP device efforts and signal sample t2's complement represt1's complement represt2's and 1's complement	s using esentation esentation	consider representi	ng
7)	The L2 cache	of Kv	vord is shared by h	ooth program and da	ta

c) 16 d) 64



8)	The TMS320C6X	fixed point proce per instruction cycl		ors execute up	to _	,
	a) 8,32	b) 32,8		16,16	d)	16,8
9)	The C6X pipeline real 2	equires b) 24	c)	phases in decod 5	le s <sup>.</sup> d)	
10)	independent a) 4		a fe			and nonintrusive I/O. 16
11)	DSP processors ca a) Image processir c) Signal processir	ng	b)	nt Video processir All above	_ap ng	plication.
12)	In TMS320C6X into a) Separate progra c) Only program	_	b)		ogr	am and data
13)	The data move (DNa) Either direct and b) Either direct or i c) Indirect address d) All above	d indirect addressir ndirect addressing	ng r	node		
14)	The result of opera a) ACC	tion performed in o b) ACCB				
15)	SRAM and integrat a) Single ported c) Single/dual porte		b)	erals in ADSP-2 Dual ported Both a) and c)	106	31 are
16)	The TMS 320C6X (a) VelociTl					
17)	Theaffecting the content a) Parallel logic unc) Central ALU	nts of ACC.	b)	f logical operation  Auxiliary ALU  None	on (	on data without
18)	c) They have same	rate memory bus suction the enable demonstrates the memory bus stru	stru lata ıctu	ıcture for data ar ı transfer betwee re for data and p	nd p n th rog	orogram ne program and data
19)	The No. of 32 bit gea) 4	eneral purpose reg b) 8			d)	32
20)	The multipliers multa) 16,16	tiply X b) 17,17	c)	numbers. 24,24	d)	32,32


Seat	
No.	

## B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 (Elective – II) DSP PROCESSORS AND APPLICATION (New)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) **Assume** suitable data if necessary.

#### SECTION - I

### 2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Compare between fixed point and floating point DSPs.
- 2) Explain different buses of TMS 320C54X with their functions.
- 3) Enlist the features of ADSP-21061.
- 4) Explain the various register used with the ARAU.
- 5) What is the use of floating point DSPs?

#### 3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) List relative demerits and merits of RISC and CISC processors.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

#### SECTION-II

#### 4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw Cache Configuration Register (CCFG).
- 2) Explain internal memory organization in 6X DSPs.
- 3) Explain the operation of L2 cache controller.
- 4) Explain FIR implementation using TMS320C6X DSP processor.
- 5) Explain the function of EMIF in C6X.

#### 5. Attempt any two:

- 1) Discuss the implementation of FFT algorithms using TMS320C6X DSP processor.
- 2) Draw and explain TMS320C6X with peripherals.
- 3) Explain internal architecture of TMS320C6X processor.

	Set F

a) 2

b) 4

## **SLR-EP - 476**

				<b>32</b> 11 <b>2</b> 1 17 <b>3</b>
Seat No.				Set <b>Q</b>
B.E.	•		nication) (Part – I SORS AND APPLI	l) Examination, 2016 CATION (New)
-	nd Date : Thurso 3.00 p.m. to 6.	day, 24-11-2016 .00 p.m.		Total Marks: 100
	Instructions:	in Answer Book I 4) <b>Answer MCQ/OI</b> <b>Don't forget to n</b>	e data if necessary.  Pulsory. It should be so  Page No. 3. Each que  bjective type question  nention, Q.P. Set (P/	solved in <b>first 30 minutes</b> estion carries <b>one</b> mark. <b>ons on Page No. 3 only.</b> Q/R/S) on Top of Page.
Duratio	on : 30 Minutes	MCQ/Objectiv	e Type Questions	Marks : 20
	noose the corre	ct answer :		(20×1=20)
			SPs is based on c) Velocit	•
,	affecting the c a) Parallel log c) Central AL ) The 320c54 D a) They have	contents of ACC. gic unit U OSP are said to have separate memory b	b) Auxiliary ALU d) None advanced harvard ar us structure for data	chitecture because and program
<b>4</b> \	<ul><li>c) They have</li><li>d) The conter</li></ul>	same memory bus	structure for data and ory cannot copy into d	een the program and data I program ata memory or vice versa
7,	a) 4		c) 16	d) 32
5)	) The multiplier a) 16,16	s multiplyX b) 17,17		d) 32,32
6)	The TMS3200 a) Floating po c) Floating/fix		_ processor. b) Fixed point d) All above	
7)	•	, .	arithmetic on c) Signed, 32	
8)	) The C6X pipe	line requires	phases in feto	ch stage.

c) 5

d) 6

	memory space.					
	a) 4	b) 8	c)	16	d)	64
13)	The TMS320C6X bit	fixed point proce per instruction cycl		ors execute up	to _	,
	a) 8,32	b) 32,8		16,16	d)	16,8
14)	The C6X pipeline re	equires		_phases in decod	le s	tage.
	a) 2	b) 24			d)	
15)	independent		a fe	tch, instruction fe	tch	and nonintrusive I/O
	a) 4	b) 8	c)	6	d)	16
16)	DSP processors ca	-				plication.
	<ul><li>a) Image processi</li><li>c) Signal processi</li></ul>	=		Video processii All above	าg	
17)	In TMS320C6X into a) Separate program c) Only program	•	b)		ogr	am and data
18)	The data move (DNa) Either direct and b) Either direct or i c) Indirect address d) All above	d indirect addressing indirect addressing	ng i	mode		
19)	The result of opera	tion performed in o				into PREG
20)	SRAM and integrat a) Single ported c) Single/dual port		b)	erals in ADSP-2 Dual ported Both a) and c)	106	31 are
				· · · · · ·		Sat C

Seat	
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## B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 (Elective – II) DSP PROCESSORS AND APPLICATION (New)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) **Assume** suitable data if necessary.

#### SECTION - I

### 2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Compare between fixed point and floating point DSPs.
- 2) Explain different buses of TMS 320C54X with their functions.
- 3) Enlist the features of ADSP-21061.
- 4) Explain the various register used with the ARAU.
- 5) What is the use of floating point DSPs?

#### 3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) List relative demerits and merits of RISC and CISC processors.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

#### SECTION-II

#### 4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw Cache Configuration Register (CCFG).
- 2) Explain internal memory organization in 6X DSPs.
- 3) Explain the operation of L2 cache controller.
- 4) Explain FIR implementation using TMS320C6X DSP processor.
- 5) Explain the function of EMIF in C6X.

#### 5. Attempt any two:

- 1) Discuss the implementation of FFT algorithms using TMS320C6X DSP processor.
- 2) Draw and explain TMS320C6X with peripherals.
- 3) Explain internal architecture of TMS320C6X processor.

	Set Q


Seat No.				Set R
B.E.	•	and Telecommu		II) Examination, 2016 ICATION (New)
-	nd Date : Thurso 3.00 p.m. to 6.	day, 24-11-2016 00 p.m.		Total Marks: 100
	Instructions :	in Answer Book I 4) <b>Answer MCQ/O</b> k	e data if necessary. I <b>ulsory</b> . It should be Page No. <b>3. Each</b> qu <b>bjective type questic</b>	solved in <b>first 30 minutes</b> lestion carries <b>one</b> mark. <b>ons on Page No. 3 only.</b> <b>'Q/R/S) on Top of Page.</b>
		MCQ/Objectiv	e Type Questions	
Duratio	on : 30 Minutes			Marks : 20
1. Ch	oose the corre	ct answer :		(20×1=20)
1)	DSP processo a) Image prod c) Signal prod	•	plement b) Video proces d) All above	application. sing
2)		X internal memory is program and data am	_	program and data
3)	a) Either dire	e (DMOV) instruction ot and indirect addres ot or indirect address dressing	ssing mode	
4)	The result of ca) ACC	pperation performed b) ACCB		tored into d) PREG
5)	SRAM and int a) Single port c) Single/dua		peripherals in ADSP b) Dual ported d) Both a) and c	
6)		C6X generation of D9 b) Velocity	SPs is based on c) Velocit	
7)	affecting the c	contents of ACC.	- ,	ation on data without
	<ul><li>a) Parallel log</li><li>c) Central AL</li></ul>		<ul><li>b) Auxiliary ALL</li><li>d) None</li></ul>	Ј Р.Т.О.
	•		•	



8)	The 320c54 DSP a	re said to have adv	/an	ced harvard arch	nite	cture because
Ο,	a) They have sepa					
	· ·					ne program and data
	c) They have same	<del>-</del>		-	_	
٥)					a m	nemory or vice versa
9)	The No. of 32 bit ge a) 4			ers in Cox is 16	٩/	32
10\	•	•	,		u)	0 <u>2</u>
10)	The multipliers multa a) 16,16				d)	32,32
11)	The TMS320C6X is	•	•		,	,
,	a) Floating point	Ρ.		Fixed point		
	c) Floating/fixed po	oint	d)	All above		
12)	The AR ALU (ARAL					
	a) Unsigned, 16	b) Singed, 16	c)	Signed, 32	d)	Unsigned, 32
13)	The C6X pipeline re					
	a) 2	b) 4	•		d)	6
14)	Only data ADSP-21				\اء	64
<b>1</b> _ \	a) 8	b) 16	C)	32	u)	64
15)	ADSP-21061 is a) Harvard architect	otura	h)	Advanced Han	ard	architecture
	c) Super Harvard		•		aru	architecture
16)	To use a fixed poin				nsid	ler representina
. • ,	filter coefficients ar			•		.oop.ooog
	a) Fixed point2's co					
	b) Fixed point1's co	•				
	<ul><li>c) Fixed point2's a</li><li>d) None</li></ul>	na i s compiemen	t re	presentation		
17\	The L2 cache of	Kwo	rd i	is shared by both	nnr	ogram and data
' <i>' ,</i>	memory space.		Iu	3 Shared by both	ı pı	ogram and data
	a) 4	b) 8	c)	16	d)	64
18)	The TMS320C6X	fixed point proces	ssc	ors execute up	to _	<b>,</b>
	•	per instruction cycl				
	a) 8,32	b) 32,8	-	16,16	,	16,8
19)	The C6X pipeline re					
) )	a) 2	b) 24	,		d)	
20)						and nonintrusive I/O. 16
	a) 4	b) 8	U)	6	u)	10

Seat	
No.	

## B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 (Elective – II) DSP PROCESSORS AND APPLICATION (New)

Day and Date: Thursday, 24-11-2016

Marks: 80

Time: 3.00 p.m. to 6.00 p.m.

Instructions: 1) All questions are compulsory.

2) **Assume** suitable data if necessary.

#### SECTION - I

### 2. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Compare between fixed point and floating point DSPs.
- 2) Explain different buses of TMS 320C54X with their functions.
- 3) Enlist the features of ADSP-21061.
- 4) Explain the various register used with the ARAU.
- 5) What is the use of floating point DSPs?

#### 3. Attempt any two:

 $(10 \times 2 = 20)$ 

- 1) List relative demerits and merits of RISC and CISC processors.
- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

#### SECTION - II

#### 4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw Cache Configuration Register (CCFG).
- 2) Explain internal memory organization in 6X DSPs.
- 3) Explain the operation of L2 cache controller.
- 4) Explain FIR implementation using TMS320C6X DSP processor.
- 5) Explain the function of EMIF in C6X.

#### 5. Attempt any two:

- 1) Discuss the implementation of FFT algorithms using TMS320C6X DSP processor.
- 2) Draw and explain TMS320C6X with peripherals.
- 3) Explain internal architecture of TMS320C6X processor.

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Seat No.						Set	S
B.E.	-	and Telecom			-		2016
-	d Date : Thurso 3.00 p.m. to 6	day, 24-11-2016 .00 p.m.				Total Marks	: 100
,	Instructions :	4) Answer MCc Don't forget	table data i compulsory cok Page N Q/Objective to mention	f necessa r. It should lo. 3. Eac e type qua n, Q.P. Se	d be solved th question estions or t (P/Q/R/S	n carries <b>one</b> r	nark. <b>nly.</b>
Duratia	on a OO Minastee	_	ective Type	Questio	ns	Mayl	
	on : 30 Minutes oose the corre						s : 20 1 <b>=20)</b>
1)	filter coefficie a) Fixed poin b) Fixed poin	d point DSP devi nts and signal sa t2's complement t1's complement t2's and 1's com	amples usir representa representa	ng ation ation		er represenur	g
2)	The L2 cache memory space	of e.	K word i	s shared l	by both pr	ogram and dat	:a
	a) 4	b) 8	c)	16	d)	64	
3)	The TMS320	C6X fixed poin _ bit per instruct	-	rs execu	te up to _		_,
	a) 8,32		c)	16,16	d)	16,8	
4)	= =	line requires				_	
	a) 2	b) 24	c)		d)		
5)	indepe a) 4	ndent buses for d b) 8	lual data fet c)			and nonintrusiv 16	/e I/O.
6)	•	ors can be used t	,		•		
,	a) Image proc	cessing	b)	Video pro	ocessing	•	

7) In TMS320C6X internal memory is organized as

a) Separate program and datac) Only program

b) Not separate program and data

d) Only data



8)	The data move (DNa) Either direct and b) Either direct or i c) Indirect address d) All above	d indirect addressir ndirect addressing	ng r	node		
9)	The result of opera a) ACC	tion performed in o		tral ALU are stor TREG0		into PREG
10)	SRAM and integrat a) Single ported c) Single/dual porte		-	erals in ADSP-2 Dual ported Both a) and c)	106	61 are
11)	The TMS 320C6X (a) VelociTI					
12)	Theaffecting the content a) Parallel logic unc) Central ALU	nts of ACC.	b)	f logical operation  Auxiliary ALU  None	on (	on data without
13)	c) They have same	arate memory bus suction the enable de e memory bus stru	stru lata ıctu	cture for data ar transfer betwee re for data and p	nd p n th rog	rogram ne program and data
14)	The No. of 32 bit ge a) 4		giste			32
15)	The multipliers mu	tiplyX			d)	32,32
	The TMS320C6X is a) Floating point c) Floating/fixed po		b)		·	
17)	The AR ALU (ARAU a) Unsigned, 16			rithmetic on Signed, 32		
18)	The C6X pipeline real 2	equires b) 4	c)		sta d)	•
19)	Only data ADSP-21 a) 8	1061 is b) 16	c)	bit processor. 32	d)	64
20)	ADSP-21061 is a) Harvard architec c) Super Harvard a		,	Advanced Harv Both b) and c)	ard	architecture

Seat	
No.	

# B.E. (Electronics and Telecommunication) (Part – II) Examination, 2016 (Elective – II) DSP PROCESSORS AND APPLICATION (New)

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Instructions: 1) All questions are compulsory.

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#### SECTION - I

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- 2) Explain different buses of TMS 320C54X with their functions.
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- 4) Explain the various register used with the ARAU.
- 5) What is the use of floating point DSPs?

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(10×2=20)

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- 2) Explain memory and IO interface features of ADSP 21061.
- 3) What are the various interrupts supported by 54X DSPs and explain in detail?

#### SECTION-II

#### 4. Attempt any four:

 $(5 \times 4 = 20)$ 

- 1) Draw Cache Configuration Register (CCFG).
- 2) Explain internal memory organization in 6X DSPs.
- 3) Explain the operation of L2 cache controller.
- 4) Explain FIR implementation using TMS320C6X DSP processor.
- 5) Explain the function of EMIF in C6X.

#### 5. Attempt any two:

- 1) Discuss the implementation of FFT algorithms using TMS320C6X DSP processor.
- 2) Draw and explain TMS320C6X with peripherals.
- 3) Explain internal architecture of TMS320C6X processor.

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